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Toward Multi-Domain Battle: Combined Arms Precedents to Inform Today's Joint Force

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Lieutenant Colonel (Promotable), United States Army

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A paper submitted to the Faculty of the Joint Advanced Warfighting School in partial satisfaction of the requirements of a Master of Science Degree in Joint Campaign Planning and Strategy. The contents of this paper reflect my own personal views and are not necessarily endorsed by the Joint Forces Staff College or the Department of Defense.

This paper is entirely my own work except as documented in footnotes.

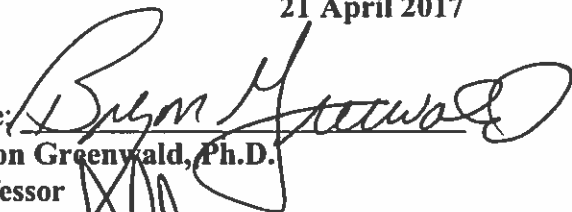
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ABSTRACT

Since 2003, revisionist states have developed new operational concepts and deployed new technologies to contest the U.S. Joint Force across all domains. To address this military problem, the U.S. Army and Marine Corps published a 2017 White Paper entitled “Multi-Domain Battle: Combined Arms for the 21st Century.” Multi-Domain Battle (MDB) envisions the Joint Force extending the principles of combined arms across all physical and abstract domains as a way toward restoring the nation’s comparative military advantage. Though compelling, the theory of MDB is currently incomplete and a long way from evolving into an executable joint warfighting capability.

Emerging from early 20th century wars with conceptual frameworks for combined arms warfare, the interwar German and Soviet militaries developed tactical and operational-level warfighting capabilities that integrated the capabilities of historically distinct arms and delivered decisions on the battlefields of World War II. In both militaries, the development of these decisive capabilities was made possible by two feats of military innovation. First, the German *Wehrmacht* and the Soviet Red Army brought about technological innovations that defined new contexts for war. Second, both militaries engineered combined-systems revolutions to prepare their forces to dominate within the whole of their new contexts.

Employing models offered by prominent military historians, this thesis examines the German and Soviet combined arms innovations to identify implications and present actionable recommendations for today’s U.S. Joint Force.

DEDICATION

For my Family.

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CHAPTER 1: INTRODUCTION

The Fragility of U.S. Military Dominance: The Present Problem

Since 2003, China, Russia, and other revisionist states have studied the U.S. Joint Force's advantage in conventional warfare and developed new operational concepts that are beginning to "upend" the American military's way of warfighting.¹ As the U.S. Joint Force focused on aligning capabilities to counterinsurgency operations, competitors deployed new technologies that increasingly enable them to contest the U.S. Joint Force across all domains.² Specifically, potential adversaries' efforts to achieve parity in guided munitions and mission command capabilities, as well as investments in operational and tactical cyber, electromagnetic warfare, and anti-space capabilities are intended to "fracture" America's mission command networks and prevent its Joint Force from fighting a war of maneuver.³ These developments present an operational challenge to the U.S. Joint Force in which an adversary will contest every domain across the depth of an extended battlefield beginning with strategic deployments from U.S. bases.⁴

¹ U.S. Army-Marine Corps White Paper. *Multi-Domain Battle: Combined Arms Operations for the XXI Century, DRAFT v. 0.53*. Army Capabilities Integration Center, Capability Development and Learning Directorate, Joint and Army Concepts Division and Marine Corps Combat Development Command, Marine Corps Warfighting Laboratory, Futures Directorate, 13 October 2016, 1 and Association of the United States Army Institute of Land Warfare. "Contemporary Military Forums V: Multi-Domain Battle". Filmed [October 2016]. YouTube video, 1:50:06. Posted [October 2016]. <https://www.youtube.com/watch?v=qkyvG7QE9A&index=9&list=PLB2hSP2dixfbBgXhhCgROsEpqPTRa60qr>. A popular narrative with a similar amount of merit in contemporary military thought argues that revisionist states studied and learned from U.S. operations since Operation Desert Shield/Desert Storm in 1991.

² U.S. Army-Marine Corps White Paper. *Multi-Domain Battle: Combined Arms Operations for the XXI Century, DRAFT v. 0.40*. Army Capabilities Integration Center, Capability Development and Learning Directorate, Joint and Army Concepts Division and Marine Corps Combat Development Command, Marine Corps Warfighting Laboratory, Futures Directorate, 29 August 2016, 2-3. U.S. Joint doctrine recognizes five domains: air, land, maritime, space, and cyberspace.

³ AUSA ILW, "CMF V: Multi-Domain Battle," and Defense Media Activity, "Defense Department Seeks Ideas for Preserving U.S. Competitive Advantage," U.S. Department of Defense, November 2, 2016, <http://www.defense.gov/News/Article/Article/994585> (accessed November 26, 2016).

⁴ ARCIC and MCCDC, *Multi-Domain Battle, DRAFT v. 0.40*, 1-10.

Multi-Domain Battle: A Possible Solution

The success of two U.S. military innovation strategies since World War II inspired former U.S. Secretary of Defense Chuck Hagel's November 2014 announcement of the Defense Innovation Initiative [DII], an endeavor he hoped would develop into a "game-changing third offset strategy."⁵ The DII constitutes a collection of strategies designed to accelerate innovation in the areas of leader development, technological research and procurement, operational concepts, wargaming, and department-wide business practices.⁶ While an overwhelming majority of think tank analyses and scholarly articles written shortly after Hagel's announcement focused on budget prioritization to secure specific emerging technologies, only a meager amount offered coherent opinions on how to employ those technologies in an integrated manner across the Joint Force. In 2017, the U.S. Army and Marine Corps published a White Paper entitled "Multi-Domain Battle: Combined Arms for the 21st Century" with this end in mind.⁷

Multi-Domain Battle (MDB) defines the "simultaneous and dynamic execution of integrated operations across all domains" as a means toward restoring the Joint Force's freedom of action and comparative military advantage. MDB "*evolves the combined arms methodology*" by incorporating the entirety of the Joint Force and other partners to act

⁵ James Carafano, "The Third Offset: The 'Fairy Dust' Strategy," *The Heritage Foundation* (blog), November 25, 2014 (accessed November 27, 2016). <http://www.heritage.org/research/commentary/2014/11/the-third-offset-the-fairy-dust-strategy>. The first reform strategy constituted President Eisenhower's *New Look* in the 50s, whereas the second comprised of *Assault Breaker* in the 70s and 80s.

⁶ Chuck Hagel, *The Defense Innovation Initiative* (Washington: U.S. Secretary of Defense, 2014).

⁷ Socialization of the MDB concept began in earnest during the summer of 2016, resulting in a substantial amount of official and unofficial commentary and analysis. The Army Chief of Staff and Marine Corps Commandant approved a final white paper for unlimited distribution on January 18, 2017. This thesis draws from the entire body of publically-available sources.

across “all [physical and abstract] domains ... the electromagnetic spectrum [EMS], the information environment, and the cognitive dimension of warfare.”⁸

The Interwar Period, 1918-1939: A Historical Corollary

During public remarks made in October 2016, U.S. Deputy Secretary of Defense Robert Work analogized the current strategic environment to the interwar period of 1918 to 1939.⁹ In doing so, Work echoed the sentiments of historians and influential U.S. policy analysts who, since the end of the Cold War, pointed to similar historical corollaries. In a chapter contribution to the book *Military Innovation in the Interwar Period*, scholars Barry Watts and Williamson Murray contended as such, citing the “extraordinary new capabilities” of emerging technologies and the competitive nature of innovation across military organizations as characteristics common to both periods.¹⁰ Andrew Marshall, the prominent former Director of the Pentagon’s Office of Net Assessment, also suggested the post-Cold War environment presented prospects for a “similar period of [military] change” that is analogous to the interwar period.¹¹

An additional parallel exists in the nature of the tactical and operational military problems confronting military organizations of the interwar period and the U.S. Joint Force today. During the interwar years, the German and Soviet militaries developed

⁸ ARCIC and MCCDC, *Multi-Domain Battle v.40*, 7 and U.S. Army-Marine Corps White Paper, *Multi-Domain Battle: Combined Arms Operations for the XXI Century*, Army Capabilities Integration Center, Capability Development and Learning Directorate, Joint and Army Concepts Division and Marine Corps Combat Development Command, Marine Corps Warfighting Laboratory, Futures Directorate, 18 January 2017, 3-7. Emphasis mine.

⁹ AUSA ILW, “CMF V: Multi-Domain Battle.”

¹⁰ Barry Watts and Williamson Murray, “Military Innovation in Peacetime,” in *Military Innovation in the Interwar Period*, edited by Williamson Murray and Allan R. Millett, (New York: Cambridge University Press, 1996), 375-378.

¹¹ *Ibid.*, 377.

warfighting concepts *centered on combined arms* to break the linear, positional defenses commonplace to World War I's western front. In doing so, both militaries restored the predominance of offensive maneuver to the contemporary battlefield. In the present era, the U.S. Joint Force, contested in all domains, faces a similar challenge in *evolving the combined arms methodology* to restore its global freedom of action.

Thesis

Though two Services conceptually identified a way towards restoring the U.S.'s comparative military advantage, the theory of MDB is both currently incomplete and a very long way from evolving into an executable joint warfighting capability. The experiences of the German and Soviet militaries from 1918 to 1944 present benchmarks of military innovation that inform both this statement and a possible way ahead.

As exhibited by the German Army's tactical-operational synergy at Sedan in 1940 and the Soviet Army's operational-strategic excellence during *Operation Bagration* in 1944, both militaries enabled battlefield success by employing warfighting capabilities *centered on joint combined arms maneuver* that were tangibly superior to those of their adversaries. The maturation of these superior warfighting capabilities was the result of two feats of interwar military innovation.

First, both militaries evolved superior *contexts for war* by accurately discerning and advancing the opportunities made possible by emerging technology. Second, both militaries designed *combined-systems revolutions* of organization, technology, and concepts to enable military activity across the whole of their newly-defined context. These revolutions wove previously disparate capabilities into a coherent whole and

produced warfighting capabilities that allowed both militaries to *cognitively outmaneuver*, and then dominate, enemies who approached war through a more parochial lens. To mature a MDB-inspired context into an executable warfighting capability today, the U.S. Joint Force must do the same.

Scope of Research, Key Terms, and Research Methodology

This paper will examine how the interwar German and Soviet militaries evolved superior *contexts for war* and then developed their own forces to win within those paradigms. To this end, the analysis will utilize Alan Beyerchen's model of military innovation, Barry Watts and Williamson Murray's notion of combined-systems revolutions, and additional analysis to inform contemporary military reform in the U.S. Joint Force. Insight derived from the historical analysis will comprise the heart of this paper's recommendations.

For purposes of brevity, several factors are deliberately beyond the scope of this study. These include: 1) the continuing requirement for the U.S. Joint Force to maintain dominance across the full range of military operations, 2) the enduring U.S. obligation to exercise caution and make good strategic decisions regarding the utilization of military force, and 3) the factors external to a military organization, particularly those of a political nature, that are also central towards bringing about military reform.

Additionally, because joint combined arms maneuver developed from the combat experiences of army and air forces, the maritime component, as well as cyber and space

capabilities, are underrepresented in the historical analysis portion of this study.¹² Before proceeding to the historical analysis, it is first necessary to further develop some key concepts.

Beyerchen's Model of Military Innovation

Alan Beyerchen presents an accessible model with which one can analyze the components of wartime and interwar military innovations. In his essay "From Radio to Radar," Beyerchen categorized military innovation into three groups ranging from the simplest to the most complex. Technical change, the simplest kind of innovation, involves "a matter of equipment or physical devices." Operational change, Beyerchen continued, "designates the new function of sets or systems and the procedures for their collective employment." The most complex stratum of military innovation, technological change, "connotes the new set of parameters ... *the new context*, emerging from the interaction of technical and operational change with each other and with the environment."¹³

In his examination of interwar innovations in electronic warfare, Beyerchen utilized this model to explain differences in the use of radar among World War II militaries. In Germany, a "belief in the primacy of technical innovation" gave way to relatively unimaginative application of superior technology.¹⁴ Alternatively, the British

¹² A larger, follow on study should include these critical components. Thus, this study serves as a contribution to future theoretical work, and ultimately real world evaluation, that should explore the integration of cross-domain capabilities on a global scale.

¹³ Alan Beyerchen, "From Radio to Radar: Interwar military adaptation to technological change in Germany, the United Kingdom, and the United States," in *Military Innovation in the Interwar Period*, edited by Williamson Murray and Allan R. Millett (New York: Cambridge University Press, 1996), 267-268.

¹⁴ *Ibid.*, 275.

innovated within a “broader framework” to bring about operational and technological change.¹⁵ Focused on defending Great Britain from air attack, they integrated radar, means of communication, and operational procedures to create an air defense system that proved decisive during the Battle of Britain.¹⁶ A third case involves the United States, who entered the war behind the Germans and British, in both a temporal and technical sense. The attack on Pearl Harbor, however, galvanized a military-industrial partnership that prompted technological innovation and a “clearer understanding of the offensive capabilities offered by radar.”¹⁷ With a greater sense of the impact radar had on the conduct of war, Americans brought about several technical and operational innovations that supported the strategic bombing campaign.

Combined-Systems Revolutions

Military historians Barry Watts and Williamson Murray identified the interwar military innovations of *Blitzkrieg*, carrier aviation, integrated air defense, strategic bombing, and amphibious warfare as examples of “combined-systems revolutions.”¹⁸ Each of these innovations took decades to develop from initial vision to operational capability due to the incredible complexity of creating a coherent whole from previously unconnected parts. Also importantly, each of these *cross-domain* innovations, required

¹⁵ Williamson Murray, “Innovation: Past and Future,” in *Military Innovation in the Interwar Period*, edited by Williamson Murray and Allan R. Millett (New York: Cambridge University Press, 1996), 306.

¹⁶ Beyerchen, “From Radio to Radar,” 265-286.

¹⁷ *Ibid.*, 294.

¹⁸ Watts and Murray, “Military Innovation in Peacetime,” 375. The origin of the term *Blitzkrieg* is not clearly attributable, though it was assuredly not a term used by the German military during the interwar period. Through a tradition of military thought spanning several centuries, German military theorists came to view warfare in two subsets: *Stellungskrieg* [a war of position] offered a repeat of World War I trench warfare and was to be avoided, whereas *Bewegungskrieg* [a war of movement] was the ideal means toward achieving a *kurz und fristig* [short and timely] victory. As the term *Blitzkrieg* is the most widely used and understood today, it is accordingly used in this thesis. See Chapter 1 of Citino’s *Blitzkrieg to Desert Storm*, for a more thorough accounting.

military organizations to “weave together” disparate theories, concepts, and cultural proclivities to apply technologies in previously-unforeseen ways.¹⁹ To accomplish innovation of such complexity, the historians argued for a coherent vision of future warfare that is nonetheless allowed to evolve over time. Among other factors, the historians also argued for intellectual rigor and institutional commitment so the evolutionary process could unfold in a way that maintains balance and [connection to] operational realities.²⁰ It is also worthwhile to emphasize the applicability of the notion of combined-systems revolutions to this thesis. *Blitzkrieg*, carrier aviation, integrated air defense, strategic bombing, and amphibious warfare, each of the interwar combined-system revolutions identified by Watts and Murray, are examples of the type of cross-domain capabilities that form the technological underpinning of MDB.

Joint Combined Arms Maneuver (JCAM)

The body of U.S. joint and service doctrine does not present a definition of JCAM, although the term is prevalent in U.S. Army concepts since 2011. Additionally, U.S joint doctrine does not offer a definition of the more basic concept of combined arms. Complicating matters, synthesis of historical studies indicates a lack of precision in the use of the term combined arms.²¹ With this in context, it is necessary to present a working definition of JCAM.

¹⁹ Ibid., 375.

²⁰ Ibid., 406-407

²¹ As an example, Jonathan M. House’s *Combined Arms Warfare in the Twentieth Century* makes numerous references to the integration of air power with ground-based maneuver forces. The cover art of this same, overall excellent book features an A-20 Bomber flying over a platoon of light tanks. When viewed in a strict modern context, this picture is not compatible with joint doctrinal definitions of combined arms as it portrays capabilities that, in current times, do not exist in one U.S. Service.

The *U.S. Department of Defense Dictionary* defines joint as “the activities, operations, organizations, etc., in which elements of two or more Military Departments participate.” Though the dictionary does not offer a definition of combined arms, it does use the term as a component of other definitions. For instance, the dictionary defines a combined arms team as “the full integration and application of two or more arms or elements *of one Service* into an operation.” This usage, coupled with the omission of a formal definition for combined arms itself, indicates inter-service disagreement and a deference to service-specific conceptualizations. The dictionary does offer four definitions of maneuver, one of which is particularly useful to this study: “the employment of forces in the operational area through *movement in combination with fires* to achieve a position of advantage in respect to the enemy.”²²

Army Doctrinal Reference Publication (ADRP) 1-02 defines combined arms as the “synchronized and simultaneous application of arms to achieve an effect greater than if each arm was used separately or sequentially.” ADRP 1-02 defines combined arms maneuver as “the application of the elements of combat power in unified action to defeat enemy ground forces; to seize, occupy, and defend land areas; and to achieve physical, temporal, and psychological advantages over the enemy to seize and exploit the initiative.”²³

Given the joint and Army definitions above, the following composite serves as this study’s working definition:

²² U.S. Department of Defense, “Department of Defense Dictionary of Military and Associated Terms,” Joint Electronic Library, December 15, 2016, <https://jdeis.js.mil/jdeis/> (accessed February 18, 2017). Emphasis added in italics. All quotations in this paragraph are from the same document.

²³ Headquarters, U.S. Department of the Army, *ADRP 1-02: Terms and Military Symbols*, (Washington, DC: 7 December 2015). All quotations in this paragraph are from the same document.

*Joint Combined Arms Maneuver is the synchronized and simultaneous application of combat power from two or more Services in unified action to achieve physical, temporal, and psychological advantages, to seize and exploit the initiative, and attain military objectives.*²⁴

Multi-Domain Battle and the U.S. Joint Force

As evidenced by the considerable amount of professional commentary generated by MDB over the last half-year, the U.S. Army and Marine Corps developed a compelling vision for operations with implications for the entire joint force.²⁵ At its core, MDB centers on the integrated employment of capabilities from all Services, across all domains and contested areas, to achieve a position of advantage over an enemy. Alternatively, MDB envisions the future Joint Force employing *cross-domain combined arms* to present an adversary with multiple, simultaneous dilemmas and achieve military objectives.²⁶ Though the final MDB White Paper chiefly considers future warfare from the perspective of ground combatants, it nevertheless begins with an upfront qualification that its constituent concepts should be expanded and refined through collaboration among all Services, as well as the Joint Force's interorganizational and multinational partners.²⁷

²⁴ JP 1-02 defines integration as "the arrangement of military forces and their actions to create a force that operates by engaging as a whole." Though integration is the desired term, the resultant working definition will not support a historical analysis of World War II. At their best, the Soviet and German armies during World War II achieved synchronization and simultaneity, but never integration.

²⁵ The Multi-Domain Battle Contemporary Military Forum that took place at the Association of the United States Army's Annual Meeting in October 2016 included a panel of four star Flag and General Officers from each of the U.S.'s service components. Over the course of researching this thesis, the author consulted over 45 professional articles and blog entries regarding MDB, cross-domain combined arms, and related concepts.

²⁶ ARCIC and MCCDC, *Multi-Domain Battle v.40*, 5-13.

²⁷ ARCIC and MCCDC, *Multi-Domain Battle v.40*, 1. Among other entities, interorganizational refers to U.S. and foreign governmental agencies and nongovernmental and commercial organizations.

1914-1944: The Origins of World War II Battlefield Decision

The period of 1914-1944 represents a particularly volatile time that saw the advent of JCAM at both the tactical and operational levels of war. At the onset of World War I, generals repeatedly wrecked their armies in attempts to restore offensive maneuver to a battlefield that favored the defense. By the war's final year, a "conceptual framework" of combined arms existed among the belligerents.²⁸ In the German Army, continuous and "conscious" adaptation through the interwar period cemented the experiences of World War I.²⁹ Germany's tactical methods, later termed *Blitzkrieg*, created a "synergy among machines, tactics, and command style that proved devastating against obliging enemies" during World War II.³⁰

Shaped by combat experiences of a different character, the Soviet Red Army developed an understanding of war more comprehensive than that of the Germans. The Red Army's interwar distinction of the operational level of war and development of the Operational Art, as well as their coinciding combined-systems revolutions of deep battle and deep operations are the quintessential examples of "the principles and techniques ... [that] first checked the blitz and then forced its modification."³¹

²⁸ Williamson Murray, "Contingency and Fragility of the German RMA," in *Military Innovation in the Interwar Period*, ed. Williamson Murray and Allan R. Millett (New York: Cambridge University Press, 1996), 159.

²⁹ Ibid.

³⁰ Dennis E. Showalter, "Military Innovation and the Whig Perspective of History," in *The Challenge of Change: Military Institutions and New Realities, 1918-1941*, edited by Harold R. Winton and David R. Mets (Lincoln: University of Nebraska Press, 2000), 229.

³¹ Ibid.

CHAPTER 2: ORIGINS OF DECISION IN THE GERMAN MILITARY

"In most cases, support rendered on the battlefield is of more value than execution of a special task." Field Marshal Count Helmuth von Moltke¹

Breakthrough at Sedan: Germany's New Context of War

A markedly superior understanding of the contemporary character of mobile warfare directly enabled the unbroken string of German tactical and operational victories in the opening campaigns of World War II. Following the Fall of France in June 1940, Allied observers came to see "themselves as defeated by a sudden, unpredictable advent of a profound change in warfare."² In other words, the observers found themselves to be victims of a combined-systems revolution of joint combined arms.

German campaigns of 1939 and 1940 remain exemplars of Clausewitz's premise that war is an endeavor "within which the creative spirit is free to roam."³ German commanders developed a more comprehensive understanding of mobile warfare than their worthy, and in many cases better-equipped, foes. Emerging from the embarrassment of World War I, these same commanders were better able to seize on the opportunities inherent to mobile warfare when loosed on enemies that prepared for a different kind of war. Of all the successes component to these opening campaigns, the combined arms penetration of French defenses at Sedan in May 1940 is particularly elucidating.

¹ Helmuth von Moltke, *Moltke on the Art of War: Selected Writings*, edited by Daniel J. Hughes (New York: Ballantine Books, 1993), 133.

² Watts and Murray, "Military Innovation in Peacetime," 376.

³ Carl von Clausewitz, *On War*, edited and translated by Michael Howard and Peter Paret (New York: Alfred A. Knopf, 1993), 101.

Operation *Fall Gelb* began at 0530 hours on 10 May 1940 with massive air strikes on 22 military airfields in Belgium, the Netherlands, and northern France. During the first day, the German Air Force destroyed 75% of the Royal Netherlands Air Force and, with a series of battalion and small unit-sized parachute drops, seized critical infrastructure across the area of operations. In just 16 hours, the Germans gained local air superiority and seized the initiative from the defending French, British, Belgian, and Dutch militaries. With operational conditions quickly established, Army Group B conducted a supporting attack into the Low Countries to fix roughly half of Allied ground forces in Belgium. With the best Allied troops then out of position to the north, the main effort of Army Group A, spearheaded by General Heinz Guderian's XIX Panzer Corps, attacked through the Ardennes Forest to penetrate the ill-prepared French troops defending along the Meuse River.⁴ Guderian's rapid armored offensive across the Meuse and to the English Channel brought about "one of the most crushing military victories of the twentieth century."⁵ At both the tactical and operational levels, several aspects of this success remain particularly significant over 75 years later.

At the tactical level of war, the German penetration at Sedan is attributable to the proficient application of combined arms during the approach through the Ardennes, the Meuse river crossing on 13 May, and the restoration of operational maneuver on 15 May. The Germans' rapid approach through the supposedly impenetrable Ardennes Forest was made possible by the use of second-rate road and trail networks, all of which were rapidly

⁴ Seven of Germany's 10 fielded panzer divisions attacked through the Ardennes Forest along a 70km front.

⁵ Watts and Murray, "Military Innovation in Peacetime," 375. These actions also earned Guderian the nickname *Der Schnelle Heinz* [fast Heinz].

improved by engineer units organic to each of the panzer divisions.⁶ Arriving at the Meuse as a coherent fighting force, the combined fires of tanks, artillery, and close air support made the infantry crossing in rubber boats possible on 13 May.⁷ Tactical-level Army and Air Force commanders coordinated the concept for close air support through face to face discussions during the run-up to the river crossing. Conceptually modelled after an artillery rolling barrage, multiple waves of Ju-87 *Stuka* dive-bombing attacks were supremely effective in disrupting communications and psychologically defeating the defenders.⁸

Once the army established far-side bridgeheads, German Air Force antiaircraft artillery repositioned to consolidate gains and enable a transition to operational exploitation. This relocation proved fortunate as air defense forces decisively defeated French and British bombing raids targeting the bridgeheads on 14 May.⁹ After 14 May, the continental-based fighting power of the British Air Force ceased to exist.¹⁰ In positioning tactical air defenses in a manner complementary to ground maneuver, the Germans employed joint combined arms in a way that gained local air superiority from the ground. This air superiority allowed German armor to immediately resume

⁶ Jonathan House, *Combined Arms Warfare in the Twentieth Century*, (Lawrence: University Press of Kansas, 2001), 116.

⁷ Ibid.

⁸ Martin van Creveld, *Air Power and Maneuver Warfare* (Maxwell Air Force Base: Air University Press, 1994), 50. Van Creveld makes clear that the *Luftwaffe* strikes at Sedan were not closely coordinated with ground maneuver and therefore not analogous to the modern definition of close air support [CAS]. In the terminology of contemporary U.S. Joint Doctrine, the *Stuka* attacks at Sedan were closer to air interdiction; the highly visible Meuse River was essentially utilized as a Coordinated Fire Line (CFL), negating the need for close integration of air and ground forces.

⁹ By the end of the day, the German air defense destroyed more than 89 Allied aircraft in the immediate vicinity of Sedan alone.

¹⁰ Ibid., 51.

operational maneuver, which consisted of an exploitation through Flanders to the English Channel on 15 May.¹¹

At the operational level, the breakthrough at Sedan and subsequent exploitation thoroughly broke the morale of the French high command. A French General sobbed hysterically at “deficiencies” in his force’s conduct of battle.¹² Lead German units reached the channel by 20 May, effectively isolating 40 French and British Divisions in Belgium. Integrated with [but not subordinate to] ground maneuver forces, the German Air Force conducted air interdiction of troop concentrations and lines of communication through the middle of May.¹³ On two occasions, the *Luftwaffe* defeated French division-sized counterattack forces, actions that protected German Army forces that otherwise had exposed flanks.¹⁴ In these examples of integrated air-ground operations in Flanders, the German Air Force did not conduct close air support, as they were not equipped with radios to do so.¹⁵ Aided by a broad understanding of the ground situation and ground commanders’ intentions, they instead conducted air interdiction at the operational level of war in a manner that devastated Allied forces and directly enabled ground maneuver.¹⁶

¹¹ Ibid.

¹² Peter Batty, “The World at War, France Falls: May-June 1940” (video), November 14, 1973, <https://www.youtube.com/watch?v=9Umlu-bcuIY&t=1889s> (accessed November 27, 2016).

¹³ Van Creveld, *Air Power and Maneuver Warfare*, 53.

¹⁴ Ibid., 49.

¹⁵ Ibid. It is frequently misunderstood that German tactical-level air and ground commanders had the capability to collaborate and coordinate close air support. Contrary to the belief that individual tanks could talk to aircraft via radio, no such equipment or systems existed. German Air Force liaisons did exist in ground army and corps headquarters, though they could not talk to individual aircraft and could not coordinate close air support. (Van Creveld 48)

¹⁶ Ibid., 53.

1918 to 1939: The Interwar Origins of the German Victory at Sedan

*"The more you sweat in peace, the less you bleed in war."*¹⁷

The seeds of decision at Sedan were sown through decades of organizational introspection, development, and training during the interwar period. Utilizing their experiences of World War I as a "point of departure" for a conscious and continuous innovation program, the Germans developed a combined-systems revolution that became "*the* revolution in military affairs of the mid-twentieth century."¹⁸ The exceedingly complex task of maturing the warfighting concept of *Blitzkrieg* into the paradigmatic military innovation of the century was made possible through: 1) realistic concept and doctrine development informed by the potential of emerging technologies, 2) rigorous experimentation, and 3) organizational structure changes to create opportunities in the new context of war. Centuries-old German martial culture, refined and cultivated in the aftermath of World War I, enfranchised each of these endeavors.

Revolution through Culture: Concept Development and Experimentation

Shortly following the end of World War I, the first Chief of Staff of the 100,000-man German Army, General Hans von Seeckt, ordered the establishment of 57 military committees to examine issues arising from the war.¹⁹ The intent of this thoroughly comprehensive review of battlefield experience was to capitalize on the knowledge of

¹⁷ General H. Norman Schwarzkopf

¹⁸ Williamson Murray, "Contingency and Fragility of the German RMA," in *The Dynamics of Military Revolution: 1300-2050*, edited by Macgregor Knox and Williamson Murray (New York: Cambridge University Press, 2008), 155-158. Italicized emphasis is Dr. Murray's.

¹⁹ Ibid., 158. The Versailles Treaty capped the German Army and Navy at a combined strength of 115,000, among other restrictions.

Germany's wartime leaders while "impressions ... were still fresh."²⁰ Von Seeckt ordered the committees to produce:

*short, concise studies of the newly gained experiences of the war and consider the following points: What situations arose in the war that had not been considered before? How effective were our prewar views in dealing with the above situations? What new guidelines have been developed from the use of new weaponry in the war? What new problems put forward by the war have not yet found a solution?*²¹

These studies engendered a force-wide undertaking bent on improvement. In the groundbreaking years following World War I, Seeckt fostered a creative military culture in which leaders freely articulated views on warfighting and their own unit's preparedness to fight.²² This culture was deeply skeptical of *Patentloesungen* [patent solutions] and *Schlagworte* [buzzwords] that promised to simplify the path to victory.²³ The abhorrence of *einseitigkeit* [simple minded one-sidedness] gave way to discourse in professional journals and education programs that "were at the cutting edge of military innovation."²⁴ This discourse led to the publication of 1921's doctrinal manual *Leadership and Combat of Combined Arms Forces* and, its ultimate revision, 1933's *Truppenfuehrung*. Influenced by Prussian military tradition and the creative application of the lessons distilled from World War I, this body of doctrine described the future of warfare and the role emerging technology would play in it.²⁵

²⁰ Ibid.

²¹ Hans von Seeckt as cited by Murray in "Contingency and Fragility of the German RMA," 158.

²² Williamson Murray, "Innovation: Past and Future," in *Military Innovation in the Interwar Period*, edited by Williamson Murray and Allan R. Millett (New York: Cambridge University Press, 2007), 314.

²³ Robert M. Citino, *Blitzkrieg to Desert Storm: The Evolution of Operational Warfare* (Lawrence: University Press of Kansas, 2004), 34.

²⁴ Ibid. and James Corum, "A Comprehensive Approach to Change: Reform in the German Army in the Interwar Period," in *The Challenge of Change: Military Institutions and New Realities, 1918-1941*, edited by Harold Winton and David Mets (Lincoln: University of Nebraska Press, 2000), 56.

²⁵ Murray, "Contingency and Fragility of the German RMA," 155-160.

In an evolution of World War I infiltration and combined arms tactics, 1933's *Truppenfuehrung* established the decisively exploitative role of tanks, even though the German Army had none at the time.²⁶ The newly-formed *Luftwaffe*'s [German Air Force] 1935 manual entitled *Luftkriegfuehrung* [Command of the Air War] provided an equally comprehensive view of future combat that stressed the "unity of all parts of the *Wehrmacht* [German armed forces] in the common struggle."²⁷ Though strategic bombing was a significant component of this early doctrine, the German Air Force did not fall prey to the "single-minded focus" of strategic aviation that was the norm in the U.S. Army and British Royal Air Forces.²⁸ Instead, with an equal emphasis on supporting ground maneuver, early German doctrine described a vision of future joint warfare that utilized military aircraft still forbidden by the Treaty of Versailles.

In the nurturing of a culture centered on creativity, the German military developed a joint warfighting doctrine before 1933 that nonetheless preceded the technical means required to put it in action. Their concepts and doctrine, grounded in the prerogatives to avoid positional warfare and bring about quick, decisive victory, presented a vision of future war that framed a new paradigm for JCAM.

Training: The Mandate to Get into the Dirt, the Sky, or on the Sea

"During peacetime training, special care must be given to mutual support of the arms since their characteristics complement each other. Only cooperation enables each individual arm to exploit its effectiveness." Field Marshal Count Helmuth von Moltke²⁹

²⁶ Ibid., 159-161.

²⁷ Corum, "A Comprehensive Approach to Change," 53-54.

²⁸ Ibid., 53.

²⁹ Von Moltke, *Moltke on the Art of War*, 154.

Constrained by prohibitions against military research and development in the Treaty of Versailles, Von Seeckt and other leaders looked for alternative means in which they could experiment and further develop warfighting capabilities. In Germany, the obligatorily under-equipped, but imaginative German Army made extensive use of dummy equipment to evaluate new concepts. In 1931, then-Lieutenant Colonel Heinz Guderian, an early advocate of armor and motorization, took command of the transitionally-equipped 3d Motor Transport Battalion with the mission of testing emerging concepts of mobile warfare. This precedent paved the way for division-sized demonstrations in 1934 and the first multi-division maneuvers in 1936.³⁰ Reflecting the joint and combined arms tenets established by early interwar doctrine, German panzer units refined the combined arms techniques and procedures required to penetrate defenses and exploit an enemy's rear area.³¹

To explore higher-end capabilities free from western observation, the German military turned eastward. In 1922, the German and Soviet militaries signed a cooperation agreement that, given the Soviet Union's closed society, provided the German military training opportunities in the Soviet Union. By 1933, the *Luftwaffe* contingent in Lipetsk, Russia supervised training for over 1200 pilots and completed much of the preliminary development for what would become the Ju-87 "Stuka" dive-bomber.³² The German Army conducted experimentation with armor and chemical weapons in the Soviet Union as well.

³⁰ Jonathan House, *Toward Combined Arms Warfare: A Survey of 20th Century Tactics, Doctrine, and Organization*, (Fort Leavenworth: Combat Studies Institute, 1984), 55.

³¹ *Ibid.*, 54.

³² Arvo Vercamer and Jason Pitts, "German Military in the Soviet Union 1918-1933," Feldgrau, 1996-2015, <http://www.feldgrau.com/articles.php?ID=23> (accessed November 27, 2016).

Whether utilizing dummy equipment or camouflaged in the Soviet hinterlands, inter-service cooperation was a prioritized component of German interwar training and field experimentation. In 1935, the first Chief of Staff of the German Air Force, General Walther Wever, directed “Army training exercises [to be used as] *Luftwaffe* exercises in order to deepen our understanding of inter-service cooperation.”³³ In 1936, the first General of Panzer Troops, General Oswald Lutz, directed his subordinate units to do the same, focusing on reconnaissance and communications exercises.³⁴ The frequency and complexity of joint training increased up until 1939, with joint force-wide exercises in 1937 that included lessons learned from German operations in the Spanish Civil War.³⁵ Commanders tested foreign doctrinal concepts for eventual inclusion in German warfighting concepts and maneuvered against opposing forces trained in the same.³⁶ This joint training paid dividends during the opening campaigns of World War II. Though there were some shortcomings in tactical effectiveness, particularly in the conduct of close air support in 1939 and 1940, the overall performance of the German joint force was markedly better than its foes.³⁷

As with other aspects of its interwar military innovation, German military culture played a centrally positive role in establishing standards and rigor for training. The contents of early doctrinal manuals, tested and optimized in joint training, became a commonly understood description for joint combined arms maneuver. This commonly understood doctrine effectively abridged combat instructions and enabled decentralized

³³ Corum, “A Comprehensive Approach to Change,” 54.

³⁴ Ibid.

³⁵ Ibid.

³⁶ Ibid., 48.

³⁷ Murray, “Contingency and Fragility of the German RMA,” 163.

joint execution during World War II.³⁸ As historians Watts and Murray contend: “what mattered most was that the Germans had evolved sound concepts for mobile, combined-arms warfare and had trained their army [and air force] to execute those concepts.”³⁹

Creating Opportunities in the New Context through Organizational Structure

Perceiving the requirement for all arms to maintain a coherent whole at all points on the future battlefield, the German Army structured and equipped each of its panzer divisions to ensure other arms could keep pace with tanks. To this end, divisions designed during the interwar period included mobile reconnaissance formations to precede the armored main body, mounted infantry and engineers to reduce enemy strongpoints and support mobility, and motorized logistics units to sustain operational reach. Beginning with the campaign in Poland in 1939, imbalances in equipment densities and capabilities across different type divisions, the German cultural proclivity to optimize organizational effectiveness, and [perhaps above all] Hitler’s desire for more panzer divisions caused the German Army Staff to reduce the number of tanks in each division. This brought the organization’s armored core even more into equilibrium with the other arms for the remainder of the war.⁴⁰

The German military tradition that originated in the 1860s of concentrating all available combat power at a decisive point obliged the integration of each of the arms at the battalion level and below.⁴¹ Though these structural features may seem intuitive in the

³⁸ House, *Toward Combined Arms Warfare*, 53.

³⁹ Watts and Murray, “Military Innovation in Peacetime,” 373.

⁴⁰ House, *Combined Arms Warfare in the Twentieth Century*, 82,109-111.

⁴¹ House, *Toward Combined Arms Warfare*, 52-53.

contemporary view, they were truly state of the art for the interwar period. As an example, the British General Staff did not identify the need for a combined arms organization below the division level until late 1940, the time they were first able to make sense of their experiences in defeat from the spring of that year.⁴² Importantly, the German Army's inclusion of all arms at all echelons in its panzer division design indicates its developed vision of a new context for future war. Instead of simply developing doctrine for the massed employment of tank formations, the Germans developed and equipped whole combined arms organizations.

With the inclusion of small, but multifunctional headquarters able to synchronize the efforts of all arms, the German Army built an additional structural advantage into its new panzer formations. The German approach enabled greater battlefield flexibility as units were able to task organize more effectively and tactical and operational level headquarters were required to accomplish the same functions, though at different scales. By 1939 in Poland, panzer divisions and their subordinate headquarters consistently task organized the different arms, including *Luftwaffe* air defense units, to meet the demands of an evolving battlefield.⁴³ In comparison, French headquarters of armor formations were not intended [and therefore not trained] to control the activities of other arms.⁴⁴

⁴² House, *Combined Arms Warfare in the Twentieth Century*, 118.

⁴³ House, *Toward Combined Arms Warfare*, 82.

⁴⁴ *Ibid.*, 85.

Conclusion

*"Sheer technical innovation, as the Germans proved, does not win wars. Instead, the interaction of technical change with organizational adaptation within a realistic strategic assessment determines whether good ideas turn into real military capabilities."*⁴⁵

Emerging from World War I in defeat, the German military conducted a factually-based review of its performance and discerned a comprehensive vision for how it would win the next war. Perceiving this new context in advance of emerging technologies, the German military tested its concepts in a rigorous fashion and ultimately structured itself to dominate the early campaigns of World War II. In this paradigmatic case of a combined-systems revolution, a martial culture of honest and intellectual debate enfranchised force-wide creativity and engendered a joint whole greater than the sum of its parts. Trained excellence at the tactical level of war gave way to stunning combat performance.

However initially stunning, the German military phenomenon was short-lived as Allied militaries avoided decisive defeat and learned from years of losing. Eventually perceiving the new context of German-defined warfare, these militaries adapted their own organizations accordingly. Of these Allied Forces, the Soviet military played the most crucial role. Although their combat adaptation in the early years of the war completed a combined-systems revolution of continental proportions, the theoretical groundwork laid during the interwar period inspired a superior mastery of operational-level warfighting and eventually led to ultimate victory.

⁴⁵ Allan R. Millett, "Patterns of Military Innovation," in *Military Innovation in the Interwar Period*, edited by Williamson Murray and Allan R. Millett (New York: Cambridge University Press, 2007), 368.

CHAPTER 3: ORIGINS OF DECISION IN THE RED ARMY

Annihilation in Belorussia: The Soviet Union's New Context of War

Scholars frequently divide the Soviet's *Great Patriotic War* into three periods of distinct political-military characteristics.¹ The first, from June 1941 until November 1942, consisted largely of German offensives through the western Soviet Union that culminated short of the capture of Leningrad, Moscow, and Stalingrad. The second period, from November 1942 until December 1943, was a "transitional" one that consisted of the Soviet encirclement of the German Sixth Army west of Stalingrad, a subsequent German counteroffensive, and, ultimately, the massive Battle of Kursk. The third period, from January 1944 until April 1945, saw the Red Army on the strategic offensive for the remainder of the war.

Of the Soviet's 10 *destructive blows* in 1944, the Soviet offensive in Belarus, codenamed *Operation Bagration*, was singularly impressive for its employment of joint combined arms at the operational level of war and its operational-strategic results. From 22 June to 19 August 1944, the Soviets massed four Army Fronts to affect the destruction or capitulation of 30 German divisions, almost the entirety of German Army Group Center.² After the war, a German historian framed this result as a "far worse catastrophe

¹ David M. Glantz, "Soviet Operational Art Since 1936," in *Historical Perspectives of the Operational Art*, edited by Michael D. Krause and Cody Phillips (Washington, DC: U.S. Army Center of Military History, 2005), 248.

² A Soviet Army Front is akin to an Anglo-American, or a German, Army Group. In total, the Soviet Army massed 15 armies against four defending German armies during Operation Bagration. As German armies were larger, this resulted in a better than a 2:1 advantage in personnel. Complicating this rudimentary comparison of forces, was Army Group Center's almost complete lack of heavy equipment, the reason for which will be discussed later in the thesis.

than Stalingrad.”³ Operationally, *Bagration* forced Army Group Center to establish new defensive positions along the Vistula and Narew rivers, 250 kilometers to the west of their previous mid-June line. From the strategic perspective of the Soviet’s 1944 summer-fall campaign, *Bagration* was complementary to other successful offensives from the Balkans to the Baltics and ultimately put the Red Army within striking distance of Berlin.

The Whole of the Soviet 1944 Summer-Fall Campaign

Three features of Russian operational-strategic thinking surrounding *Operation Bagration* are particularly important towards understanding the Soviet’s new context of war. The first feature centers on the *Stavka*’s [Soviet Supreme High Command] campaign planning. While planning for the forthcoming summer-fall campaign in the spring of 1944, the *Stavka* envisioned four *successive* offensives across the breadth of the World War II eastern front. The *Stavka* relied on the *operational maneuver* of groups of multiple army fronts to accomplish the objectives of each offensive, which in each case entailed the destruction of a single German Army Group. The successive destruction of each German Army Group would produce favorable conditions, primarily in terms of operational-level force correlations, for subsequent offensives.⁴ In grandly simplistic terms, the Soviet plan for the summer-fall campaign of 1944 entailed the sequential destruction of German forces in Belorussia, then southern Poland, the Balkans, and the Baltics.

³ Artem Drabkin and Aleksey Isaev, “Soviet Storm: World War 2 in the East - Operation Bagration (11 of 18)” (video), 2011, <https://www.youtube.com/watch?v=w1SZRpPGVUk> (accessed December 9, 2016).

⁴ David M. Glantz, “Soviet Operational Art Since 1936,” 260.

The second feature centers on condition-setting through the application of *maskirovka*, a term crudely analogous to the art of deception.⁵ In the run-up to *Operation Bagration*, the Red Army employed various forms of *maskirovka* at every level of war to severely disrupt the German defense. Before *Bagration*, Hitler was confident of a mid-May intelligence assessment that the next offensives would come in the north and the south and that the center would remain relatively static.⁶ He consequently ordered the repositioning of the 56th Panzer Corps, Army Group Center's primary tank force and only operational reserve, to Ukraine. This decision effectively gave the Soviet Army a 10:1 advantage in tanks and assault guns in the *Bagration* area of operations.⁷ Though Army Group Center and its subordinate armies eventually identified elements of the Soviet troop concentration opposite them in mid-June, the Germans woefully underestimated the Soviet's actual strength and failed to appreciate "the operational or strategic significance of their knowledge."⁸

The third feature involves the Soviet's close integration of partisan warfare with the operations of regular forces. "Like smoldering embers [that consumed] the basic foundations of the force", partisan activity in the spring of 1944 caused the German eastern front to dedicate well over 200,000 *front-line* Soldiers to rear area security operations.⁹ During the

⁵ William M. Connor, *Analysis of Deep Attack Operations, Operation Bagration, Belorussia, 22 June-29 August 1944* (Fort Leavenworth: Combat Studies Institute, March 1987), 22 and JB Vowell, "Maskirovka: From Russia, with Deception," *Real Clear Defense*, October 31, 2016, , http://www.realcleardefense.com/articles/2016/10/31/maskirovka_from_russia_with_deception_110282.html (accessed November 2, 2017). *Maskirovka*, the Russian term for the art of deception is not analogous to U.S. concepts of military deception (Vowell). A much more comprehensive expression for operational security and deception, it is at its base, intended to "inflict confusion, doubt, and mistrust" and even has a "connotation of positive or active control of the enemy". (Vowell and Connor, 22)

⁶ Bruce R. Pirnie, *Soviet Deception Operations During World War II* (Washington, DC: U.S. Army Center of Military History, 1985), 11.

⁷ Connor, *Analysis of Deep Attack Operations*, 16.

⁸ *Ibid.*, 30.

⁹ Clausewitz, *On War*, 579 and G.K. Otis, "Rear Area Security in the Field Army Service Area" (MMAS thesis, U.S. Army Command and General Staff College, 1965), 40. Otis' 1965 MMAS thesis, along with additional literature published prior to the end of the Cold War, provides substantial insight into the Soviet's integration of partisan warfare activities with regular force operations. Hybrid warfare is not new,

three days prior to *Bagration*'s initiation, partisans in Belorussia conducted 26 attacks on German headquarters and successfully detonated over 10,000 charges on lines of communication to further disrupt operations.¹⁰ As the decisive phases of Operation Bagration began on 22 June, partisans communicated with Soviet tank armies via radio, cut additional roads, ambushed troop movements, and seized critical river crossing sites to further facilitate Soviet maneuver.¹¹ As an "integral" arm to the force that destroyed Army Group Center, partisans created a *second front* that played a major role in disrupting German cohesion and unity of action.¹²

Operational JCAM Applied – The Soviet Deep Operation

At its core, *Operation Bagration*'s ground maneuver plan consisted of a series of near-simultaneous and then successive encirclement operations. The main offensive began in staggered fashion to create the appearance of isolated tactical activity.¹³ Beginning with the First Baltic Front's reconnaissance in force the evening of 22 June, the Soviets followed up with tactical penetrations of German defenses in vicinity of Vitebsk and Bobruisk on 23 and 24 June.

In the north at Vitebsk, the Soviet 1st and 3rd Army Fronts achieved penetrations from the north and east and encircled the defending German 53rd Corps. Though Hitler eventually authorized a partial withdrawal of the corps on 25 June, permission came too late to achieve a breakout. The corps fell victim to the combined effects of Soviet tactical

but unfortunately, an extant body of knowledge has been relatively lost by the current popular debate. On the eastern front in 1944, there were over 143,000 Soviet partisans operating in Belorussia alone.

¹⁰ Connor, *Analysis of Deep Attack Operations*, 27.

¹¹ Russell W. Glenn, "Soviet Partisan Warfare: Integral to the Whole" (Monograph, U.S. Army School of Advanced Military Studies, 1988), 29.

¹² *Ibid.*, 29-33.

¹³ Another manifestation of *maskirovka*.

airpower and artillery and ultimately surrendered on 27 June. In the south at Bobruisk, the 1st Belorussian Front succeeded in encircling the German 9th Army on the same day. Under the combined onslaught of tactical air bombardment, *Katyusha* rocket attacks, and artillery strikes, all of the 9th Army was destroyed or captured by 28 June.

The Soviet successes at Vitebsk and Bobruisk “hit like a thunderbolt” and reduced Army Group Center on the whole to “ugly scenes of panic.”¹⁴ As each of the tactical penetrations were still developing, three Soviet army fronts opened operational exploitations with army-level attacks towards Minsk, deep in Army Group Center’s rear area. As German forces in the near tactical fight collapsed, they came under constant attack by *Ilyushin* IL-10 ground attack aircraft, particularly along the Mogilev-Minsk Highway where the Germans retained a lone bridge over the Berezina River.¹⁵ Desperate German attempts to stop the exploitation included the commitment of medium range bombers in non-standard daylight raids and the arrival of a lone panzer division from the Ukraine; these efforts only served to disrupt the Soviet exploitation for a few days. By 3 July, lead elements of the 1st and 3rd Belorussian Army Fronts linked up west of Minsk and completed the encirclement of two additional German armies. Within a week, the encircled remnants of Army Group Center were either destroyed or surrendered. As per their campaign plan, the Soviets then began final preparations for follow-on offensives in the north and south.

¹⁴ Robert Citino, “Stalin’s Revenge” video of lecture, The 2014 International Conference on World War II, The National WWII Museum, New Orleans, LA, December 2014, <https://livestream.com/nww2m/events/3632330/videos/70403585> (accessed December 7, 2017).

¹⁵ Drabkin and Isaev, “Soviet Storm: World War 2 in the East” and Van Creveld, *Air Power and Maneuver Warfare*, 143.

As with all histories, the Red Army's overwhelming success during *Operation Bagration* and, more broadly, its ultimate victory during the *Great Patriotic War*, can be explained in a number of ways. Among other valid narratives, historians attribute the origins of victory in 1945 to the Soviet state's emerging industrial capacity, the Red Army's adaptation through the initial years of war, and the Soviet peoples' collective resilience. But the origins of victory during *Operation Bagration* are found in the Red Army's formative wars and the interwar period. The models utilized in this thesis present a compelling lens through which to view these origins.

1914-1944: The Origins of the Soviet's Victory in Belorussia

Established on 28 January 1918 in the aftermath of 1917's February and October Revolutions, the first task of the Workers' and Peasants' Red Army was to consolidate Bolshevik political power. Over its first four years, the Red Army found itself in near-constant combat with foreign and domestic threats to the nascent Soviet Russia.¹⁶ Over these formative years, the first Soviet War Commissar Leon Trotsky instituted a number of practical reforms to increase the effectiveness of the Red Army.¹⁷

Among these reforms was Trotsky's decision to bring in *voin-spetsy* [military specialists], a politically-acceptable euphemism for former officers of the Imperial Russian Army. These former czarists made a "decisive contribution to the planning and

¹⁶ Among the Red Army's first adversaries were the White Russians during the Russian Civil War (1918-1922) and the Polish Army during the Polish-Soviet War (1919-1921). Additionally, a total of 13 nation-states contributed troops to the multinational Allied Intervention (1919-1925) that took place following World War I.

¹⁷ Condoleezza Rice, "The Making of Soviet Strategy," in *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, edited by Peter Paret (Princeton: Princeton University Press, 1986), 650-652.

conduct of Red Army operations” during the Russian Civil War, which ended with consolidation of political power in Moscow and the creation of the Union of Soviet Socialist Republics [USSR] in 1922.¹⁸ Also importantly, inclusion of the former czarists ensured continuity with the rich tradition of pre-revolutionary Russian military thought and the combat experiences of World War I.¹⁹ Because of this, the eight years of combat experience from 1914 to 1922 must be viewed holistically as the crucible event that inspired the Russian advancement of military science during the interwar period.

The Uniqueness of Russian Experience

Even the briefest accounts of the complexity of Russian experience during these eight years of war is beyond the scope of this thesis, though it is necessary to outline two overarching narratives. First, Russian wartime experiences from 1914 until 1922 entailed a relatively small amount of forces operating in a relatively large amount of space. Because of this, none of the belligerents could establish continuous, linear defenses similar to those commonplace on the western front in World War I. Accordingly, a “greater degree of fluidity” existed on the eastern front during the world war.²⁰ Similarly, the Russian Civil War was a “conflict of exceptionally wide-ranging maneuver” as the Red Army endeavored to extend political control across the immense Eurasian landmass that would become the USSR.²¹

The second overarching narrative emerging from the wars on either side of the Bolshevik Revolution tells the story of an increasingly effective and “operationally

¹⁸ Richard W. Harrison, *The Russian Way of War: Operational Art, 1904-1940* (Lawrence: University Press of Kansas, 2001), 83.

¹⁹ *Ibid.*, 87.

²⁰ *Ibid.*, 61.

²¹ *Ibid.*, 85.

conscious” Russian, then Soviet war machine.²² During World War I, bad compromises in strategic thinking and unimaginative, indecisive, and discordant operational leadership conspired to temper the ferocity of the Imperial Russian Army.²³ Deficiencies in mobility, mission command, and sustainment frequently forced offensives to culminate prematurely. Even General Aleksei Brusilov’s Lutsk Operation of 1916, which was later hailed as “the greatest Russian success of the war,” failed to achieve clear operational results and pushed his force past the point of culmination.²⁴

During the Russian Civil War, the Red Army rectified some of the strategic and operational shortcomings exhibited by its imperial predecessor. A cohort of new revolutionary officers, not trained in and therefore unwedded to, traditional methods of warfighting solidified concepts for mission command and established entire corps and armies of mounted cavalry.²⁵ Gradually, these operational adaptations enabled the Red Army to sustain raids and other maneuvers over increasing distances and time.²⁶

Experiences of the Civil War also began to bring the full potential of maneuver deep into an enemy’s rear to the fore of Soviet military thought. In 1919, successful White Army cavalry raids, enabled by reconnaissance aircraft, went deep into Bolshevik territory. Their success caused significant political concerns and forced the Bolsheviks to

²² Shimon Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory*, (London: Frank Cass, 2006), 142-153.

²³ Harrison, *The Russian Way of War*, 40-66.

²⁴ Ibid., 66, 68-70. Harrison also observes that Brusilov’s operational plan, which entailed the tactical concentration of assault forces along specific axes within the context of a broad-front offensive proved to be a “point of departure” for post-war theoretical discussion.

²⁵ Naveh, *In Pursuit of Military Excellence*, 144. Further development of the Army Front as an *operational level headquarters* was a particularly significant development here.

²⁶ Harrison, *The Russian Way of War*, 144-148.

organize forces specifically intended to reduce the threat.²⁷ In Poland, similar Soviet cavalry raids succeeded in creating a “powerful, irresistible fear” behind the Polish Army’s front.²⁸ These experiences seeded future Red Army thinking on the integration of mobile ground and air forces to affect the enemy at his operational and strategic depths.²⁹ Other Soviet thinkers began to consider the political and psychological effects brought about by maneuver in the enemy’s rear areas. Expanding on this thought, Mikhail Tukhachevsky considered political subversion and class warfare as activities complementary to large-scale maneuver.³⁰ Post-war Soviet histories referred to the increasing depth of the modern battlefield and referred to irregular warfare as “the perfect fellow-traveler” of conventional operations.³¹

In the ensuing years, the whole of these wartime experiences served as start points for Soviet theorists considering the changing character of war.³² Viewing traditional western theories of war with revolutionary skepticism, these theorists entered a post-war “crisis of consciousness” that ultimately enabled them to think about war in different ways.³³ In the 1920s and 1930s, this “cognitive revolution in military thinking” enabled the Red Army to discern a new context of war.³⁴

²⁷ Jacob W. Kipp, “The Origins of Soviet Operational Art, 1917-1936,” In *Historical Perspectives of the Operational Art*, edited by Michael D. Krause and Cody Phillips (Washington, DC: U.S. Army Center of Military History, 2005), 224.

²⁸ *Ibid.*, 227.

²⁹ *Ibid.*, 224-225.

³⁰ *Ibid.*, 224.

³¹ Glenn, “Soviet Partisan Warfare: Integral to the Whole,” 12.

³² It’s important to note, that all theorists cited in this thesis were serving Red Army officers.

³³ Naveh, *In Pursuit of Military Excellence*, 142-144.

³⁴ *Ibid.*, 142.

Foundations of Military Intellectualism

"It would seem that nothing could be higher than experience in war itself, and yet historical experience shows us that without the criticism of science, without the book, it, too, is of no use." Aleksandr Nezmanov, Imperial Russian and Soviet General Staff Officer

In the early 1920s, Mikhail Frunze, a front commander during the Civil War, served as the Deputy War Commissar, eventually succeeding Trotsky as the Commissar in January 1925. Though in this latter office for less than 10 months, Frunze instituted a series of military reforms that succeeded in laying the framework for the examination and consolidation of Russian wartime experiences.³⁵ Heavily influenced by "weak and sloppy" strategic staff work during the Civil War, Frunze worked to centralize military decision-making through the establishment of a formal Red Army Staff.³⁶ Intent on making the staff the Red Army's elite "intellectual center of gravity," Frunze carefully selected its original membership from the ranks of both the *voin-spetsy* and a cohort of revolutionary Red officers who had distinguished themselves as operational commanders during the Civil War. In doing so, Frunze created a balanced intellectual body that was fluent in both pre-revolutionary military thought and the operational realities of modern warfare.³⁷

Complementary to this, Frunze championed the development of military scientific societies and the re-establishment of military academies and argued for the formulation of a *unified military doctrine*.³⁸ He intended this doctrinal body to transform the army into a

³⁵ Rice, "The Making of Soviet Strategy," 660.

³⁶ Ibid., 660.

³⁷ Naveh, *In Pursuit of Military Excellence*, 149.

³⁸ Kipp, "Military Reform and the Red Army, 1918-1941," 127-129. Among Frunze's compatriots in these endeavors were Alexander Svechin and Mikhail Tukhachevsky. Topics of study at the military academy

“unified organism” held together “by a unity of views as to the *character* of military tasks facing the republic.”³⁹ Though Frunze died before this debate was settled, his argument established a requirement for doctrine that gained widespread approval a short time later.⁴⁰ More broadly, his call for an examination of the changing character of war initiated a centrally-pervasive theme of the discourse that would shape the development of the Red Army. Against the backdrop of revolutionary times, Frunze’s legacy was to move the responsibility for military thinking from revolutionary politics to the leadership of the Red Army itself.⁴¹ Collectively viewing war as something sure to come again, the leadership of the Red Army went about envisioning future war and then determining how their organization would win it.⁴² Though rife with political motivations that ultimately turned deadly, the discourse that followed was nonetheless a *cumulative evolution of ideas*.⁴³ Drawing from theory, history, and experience, its participants examined future war through an iterative process of analyzing and refuting, or expanding upon, each other’s ideas. This process resulted in a *new context of war* that enabled decision in 1944 Belorussia.

The Red Army’s New Context for War – Operational Art

The most significant and enduring legacy of the debate among Soviet military theorists is the distinction of an operational level of war and the conceptualization of the

included history, military theory, strategy, tactics, and increasingly, the “practical details and techniques” of operations. To accomplish this, Frunze invigorated a wargaming program. His approach “[unified] theory and practice,” a major development in Russian military heritage.

³⁹ Harrison, *The Russian Way of War*, 123. Emphasis mine.

⁴⁰ Frunze died following a surgical operation during which he was administered an overdose of chloroform.

⁴¹ Rice, “The Making of Soviet Strategy,” 660.

⁴² Kipp, “Military Reform and the Red Army, 1918-1941,” 127.

⁴³ Kipp, “The Origins of Soviet Operational Art,” 213. Emphasis mine.

operational art.⁴⁴ In the early 1920s, Soviet military leaders wrestled to explain the expanded depth and duration of modern maneuver warfare as they had experienced it. They additionally admired the growing inconclusiveness of war, citing the inherent difficulties in bringing about the Clausewitzian ideal of complete destruction of an enemy's fielded army. They concluded that tactical operations alone could no longer deliver strategic results.⁴⁵

Conservatives brought continuity of thought from 19th Century European and late-Imperial theorists to this debate. Accordingly, terms such as "grand tactics" and "lower strategy" were routinely, though imprecisely, used to describe the level of wartime activities that fell between the traditional concepts of strategy and tactics.⁴⁶ By the mid-1920s, theorists from all camps came to refer to this middle level of war as operations.⁴⁷ In 1926, Alexander Svechin defined the activities that took place at this intermediate level as the operational art. His observation that "tactics makes the steps from which operational leaps are assembled, strategy points out the path" is a distillation of the hierarchical, yet interdependent relationship among the levels of war.⁴⁸ Recognizing its importance, the Red Army institutionalized the operational art by establishing a separate component to the curriculum of its officer education programs. Institutionalization had the obvious effect of spurring follow-on theoretical work.

⁴⁴ The concept continues to this day in the doctrine of militaries worldwide. As Naveh observes, the U.S. turned to the Soviet example when it had its conceptual crisis in the 1970s. See *In Pursuit of Military Excellence*, page 142.

⁴⁵ David W. Glantz, "Soviet Operational Art and Tactics in the 1930s," (Fort Leavenworth, Soviet Army Studies Office, 1990), 2.

⁴⁶ Kipp, "The Origins of Soviet Operational Art," 230.

⁴⁷ Glantz, "Soviet Operational Art and Tactics in the 1930s," 2.

⁴⁸ *Ibid.*

The Soviet Combined-Systems Revolution

"The experience of recent wars showed that it is impossible to achieve the enemy's major defeat by a single operation ... 'Cannae' ... cannot be realized through a single operation." General Vladimir Triandafillov

Consecutive Operations

A major component of this follow-on intellectual exploration centered on the development of concepts for warfighting. Solving the problem of war's growing inconclusiveness was a prevalent theme of this conceptual development. In 1924, Frunze observed the "colossal survivability" of modern armies and concluded that a strategic decision could no longer "be achieved by a single blow."⁴⁹ By the end of the decade, a critical number of professional articles existed within Soviet military literature to support this notion.⁵⁰

Through this lens, the Soviets came in the 1920s to view a campaign as "the totality of actions in a defined theater of military activities over an extended period of time."⁵¹ One theorist expanded on this notion by positing that consecutive operations would be acted out in three "identifiable stages: the initial, the pursuit, and the decisive operation."⁵² Even though the Red Army of the early interwar period was still a *hoof and foot* entity, General Vladimir Triandafillov conceptualized the use of tanks and aircraft as the technological means to extend consecutive offensives into an enemy's operational depth.⁵³ The Red Army's 1929 *Field Regulations* codified these thoughts with its

⁴⁹ Harrison, *The Russian Way of War*, 152.

⁵⁰ Ibid., 153.

⁵¹ Ibid., 160.

⁵² Ibid.

⁵³ Glantz, "Soviet Operational Art and Tactics in the 1930s," 5.

emphasis on the “interworking” of arms and an emphasis on the use of tanks and motorized forces.⁵⁴

Deep Battle and Deep Operations

Commensurate with the development of the operational art, Soviet theorists also developed the techniques required to achieve tactical breakthroughs. The Soviets defined the tactical level of war as “combat by forces within an army.”⁵⁵ Theoretical work along this line focused on the application of emerging technologies to achieve the effects required by Soviet operational theories. Writing in 1931, Triandafillov observed that technologies not yet in the Red Army’s possession made former tactical methods of “gnawing through” an enemy’s linear defense obsolete. Instead, he envisioned combined arms units employing new technologies to “[simultaneously] attack [the enemy] throughout the entire depth of his position.”⁵⁶

Theorists of the time further envisioned commanders task organizing their forces into three parts to affect a two part engagement. The shock group, consisting of two thirds of an initial-echelon division or corps, would follow tactical air strikes and artillery preparation to achieve a tactical penetration. This group was organized in two to three echelons so that it could better achieve depth of effects on the enemy’s positions. A holding group, comprised of the remaining third of the initial attacking force, attacked on a supporting axis to deceive and ultimately fix the enemy. Both of these groups were to make extensive use of smoke and other deception techniques. A third mobile group

⁵⁴ Van Creveld, *Air Power and Maneuver Warfare*, 113. According to Van Creveld, the “interworking of arms” is the Russian term for combined arms.

⁵⁵ Glantz, “Soviet Operational Art and Tactics in the 1930s,” 13. As a Soviet Army is a formation analogous to a U.S. Corps, the Soviet definition of the tactical level of war is roughly equivalent to contemporary U.S. definitions.

⁵⁶ Harrison, *The Russian Way of War*, 187.

consisted of a tank or cavalry division or corps with the sole task of exploiting the enemy's operational rear.

Extensive field experimentation of these tactical concepts led to the initial codification of deep battle in 1933's *Provisional Instructions on the Organization for Deep Battle*, and further doctrinal development through the mid-1930s.⁵⁷ The tactical concept of Deep Battle also served as the basis for the Soviets to organize and equip the Red Army until 1936.⁵⁸ In this respect, warfighting theory ultimately *took precedence over* technology, the further development of which was guided "by a logical evaluation of fighting methods ... and combat requirements."⁵⁹

The Red Army's *Provisional Field Manual of 1936* serves as a summation of all the intellectual debate that predominated the 1920s and 1930s.⁶⁰ Though it presented fully-matured and executable descriptions of the tactical concept for deep battle, it only provided the theoretical basis for the coinciding operational-level concept of deep operations.⁶¹ Deep operations envisioned the employment of armies by army fronts in successive operations to encircle and destroy enemy forces.⁶² At its core, deep operations intended to "transfer [the] success of [operational strike maneuver] to the [entire] depth"

⁵⁷ Glantz, "Soviet Operational Art and Tactics in the 1930s," 12-13.

⁵⁸ Ibid., 18. Up to Stalin's first series of military purges in 1936, the Red Army underwent a period of dramatic growth and modernization. Having organized its first mechanized brigade in 1930, the Red Army had 14 mechanized brigades, 21 separate mechanized and tank regiments, and 83 separate tank battalions or companies.

⁵⁹ Naveh, *In Pursuit of Military Excellence*, 155. Naveh also reminds us the development of theory was informed by technology. He cites Tukhachevsky and Triandafillov as the originators of this interactive relationship in Russian thought.

⁶⁰ Harrison, *The Russian Way of War*, 189.

⁶¹ Glantz, "Soviet Operational Art and Tactics in the 1930s," 13.

⁶² Ibid., 13-14.

of an enemy's position.⁶³ In doing so, Soviet theorists sought to make adversarial defenses "irrelevant."⁶⁴

Through a series of large-scale field maneuvers and military district wargames in the 1930s, the Red Army tested this theoretical basis extensively.⁶⁵ With emerging Soviet industry increasingly able to field the technologies required to put this operational concept into action, the Red Army was by 1936 well on its way toward maturing a warfighting concept born from their crisis of consciousness in the 1920s.

Then, Stalin intervened. The Soviet Government shocked the country in June 1937 with an announcement that "loathsome traitors" had been uncovered in the Red Army.⁶⁶ Guilty of treason, these "counterrevolutionary military fascists" were promptly executed.⁶⁷ In a period of less than two years, Stalin purged over 40,000 from the Red Army.⁶⁸ Though the scope of effects of this widespread murder is well beyond the focus of this paper, the Red Army was relegated to nearly five years of intellectual repression, military defeat, and virtual destruction, until it regained its "operational consciousness" in the summer of 1942.⁶⁹ Born again in the crucible of another war, it reoriented on its interwar reforms to bring about decision against the *Wehrmacht*.

⁶³ Naveh, *In Pursuit of Military Excellence*, 160.

⁶⁴ *Ibid.*, 155.

⁶⁵ Glantz, "Soviet Operational Art and Tactics in the 1930s," 15 and Naveh, *In Pursuit of Military Excellence*, 159.

⁶⁶ Harrison, *The Russian Way of War*, 220.

⁶⁷ *Ibid.*

⁶⁸ According to Harrison, 60 of 67 corps commanders, 136 of 139 division commanders, and 221 of 397 brigade commanders were purged. Among those executed in the initial wave was Marshall Tukhachevsky.

⁶⁹ Naveh, *In Pursuit of Military Excellence*, 143.

Conclusion

The Red Army achieved a superior context for war by accurately discerning and communicating the opportunities inherent to modern warfare at the operational to strategic levels. This new context of war centered on an understanding of depth and war's political nature, as well as the necessity to conduct consecutive operations over time and space to bring about strategic decision. Although *Operation Bagration* has a discernible beginning and end, the Soviets conceived it as one step in a larger campaign to defeat Nazi Germany. The entirety of the operation, from condition setting to operational end states intended as start points for follow-on operations, was planned to a level of sophistication the German Army could not expect or replicate.

The differences in the character of the interwar German and Soviet military reforms is explainable by the marked variance in experiences that shaped each endeavor. On one hand, the Germans, sought to break the positional stalemates of the western front and subsequently evolved their innovation around their own World War I infiltration tactics. Alternatively, the Soviets took very different problem sets from their experiences on the more fluid eastern front and their own Civil War. The qualitative differences in each militaries' contexts for war suggests *placement*, or, how a military perceives itself winning a war, is of central importance to how effective it will actually be when fighting.

Because of a superior context, the Red Army was able to design a combined-systems revolution of technology and concepts that enabled them to capitalize on the opportunities inherent to its very own operational-strategic paradigm of war. The Soviet combined-systems revolution of deep operations, as epitomized in *Operation Bagration*, entailed joint combined arms that produced simultaneous effects into the operational

depths of Army Group Center's defense. When the results of *Operation Bagration* are compared to those of *Fall Gelb*, the efficacy of the Soviet's combined-systems revolution is both astounding and self-evident. Also, given the depth of the purges, that the Soviet Army could recall the theory and concepts is a testament to how deep in the ranks, how broad, its intellectual revolution really went.

CHAPTER 4: IMPLICATIONS FOR TODAY'S JOINT FORCE

*"The military ... should see themselves as intelligent surf riders spotting the essential currents on which to ride in a sea which is certainly disturbed and by no means friendly but on which, if they are skillful enough, they will survive."*¹

It takes considerable time to arrive at a new context for war *and* complete a combined-systems revolution that fields a military force capable of operating across the whole of that context. In innovative endeavors of historical import, neither the end result, nor the path taken to get there, are completely foreseeable. However, the history of interwar German and Soviet military reform indicates that modern innovation of historical scale can begin with a cardinal direction.

Given that perspective, this chapter utilizes current DOD force development policies and the preceding historical account to identify implications and present *actionable* recommendations for evolving MDB from concept to a mature, joint warfighting capability.² To this end, this chapter, first, identifies actions the U.S. Joint Force can take to evolve a MDB-inspired new context for war. Second, this chapter utilizes the German and Soviet combined-systems revolutions to inform development of a U.S. Joint Force that must operate across the whole of that context. Though adoption of the recommendations presented in this chapter will not, by themselves, bring about a

¹ Michael Howard, "Military Science in an Age of Peace," *Journal of the Royal United Services Institute for Defence Studies* 1, no. 5 (March 1974): 8.

² For the purposes of this analysis, the term *actionable* connotes actions that 1) are executable in the very near term, 2) would not require additional defense funding, and 3) do not require changes to existing law. Chairman of the Joint Chiefs of Staff Instruction [CJCSI] 3010.02d, dated 22 November 2013, provides guidance and responsibilities for the development and implementation of joint concepts and responsibilities associated with Joint Concept Development [JCD] processes.

Joint Force capable of MDB, their inclusion into extant policy will better posture the Joint Force to spot the “essential currents on which to ride.”³

MDB as a New Context for War

Alan Beyerchen observed that technological change, the most complex and far-reaching stratum of military innovation, results from more than the “additive combination” of new equipment and procedures.⁴ Importantly, Beyerchen noted that technological innovation develops from the *interaction* of “technical and operational change with each other and with the [operational] environment.”⁵ In turn, technological innovation produces a new *context for war* that fosters further adaptation of equipment and procedures for its use.⁶ This non-linear, iterative loop is the essence of creating a “new logic” for war and warfare.⁷

Of the required interactions presented in Beyerchen’s model, the U.S. Joint Force enjoys historically extensive access to state of the art technologies with potential for military application. This access is of fundamental importance since *technical innovation*, just as it was during the interwar period, remains a critical prerequisite for sustained military effectiveness. The U.S. Joint Force also enjoys an advanced [and rapidly evolving] capacity to promote collaboration among the agents of technical and operational change. Presently, the force utilizes the online *Defense Innovation Marketplace*, the newly-established *Defense Innovation Advisory Board*, the *Defense*

³ Michael Howard, “Military Science in an Age of Peace,” 8.

⁴ Beyerchen, “From Radio to Radar,” 298.

⁵ Ibid.

⁶ Ibid.

⁷ Ibid., 268.

Innovation Unit Experimental, and other fora to stimulate essential cooperation among industry, education and research institutions, and military leadership. Additional collaboration is fostered by several service-level organizations, as well as grassroots professional groups, such as the *Defense Entrepreneurs Forum*. Each of these initiatives performs functions that stimulate interaction among agents of operational and technical change, an additional requirement towards developing military effectiveness.⁸

While the U.S. Joint Force's force development enterprise enjoys, and should undoubtedly reinforce, these strengths, it must take action to optimize relative weakness elsewhere. To develop a paradigm-changing new context for war, the U.S. Joint Force must do two things. First, the force must modify policies and mechanisms that promote *joint* operational innovation. Second, the Joint Force must establish a centralized, joint structure to stimulate interaction between technical and operational change *with the operational environment*.⁹ Turning to historical precedent, the interwar experiences of the German and Soviet militaries inform a way for the Joint Force to proceed.

Promoting Joint Operational Innovation

The first area for focused improvement lies in the DOD's current policy and mechanisms for generating *joint* operational innovation. Beyerchen observed that the "key to [turning a] discovery or invention into successful innovation lies in whether

⁸ Recognizing these two considerable strengths, a larger, follow-on study should explore American cultural proclivities toward technology and the associated risks created by these proclivities to joint force development.

⁹ Although centralized programs exist to test Joint Operating Concepts [JOCs] through computer-based simulations and other wargames, the DOD relies on Combatant Commands and, to some degree, the Services, to test and evaluate JOCs in live environments. Though a memorandum from the Director of the Joint Staff can facilitate "broad collaboration and engagement" on an approved joint concept, this approach is inadequate towards the development of a warfighting theory with the inherent complexity of MDB. See Chairman of the Joint Chiefs of Staff Instruction [CJCSI] 3010.02d, dated 22 November 2013.

laymen can envision its possibilities.”¹⁰ Interwar German and Soviet technological innovations bore this observation out completely. In both militaries, sustained, critical examination of common military problems from a multitude of perspectives produced operational innovation centered on combined arms. With a compelling vision put forth by MDB, the Joint Force must take three actions to foster similarly creative, joint solutions.

The first of three essential Joint Force tasks at hand is to, as von Seeckt and Frunze did, provide parameters to focus further debate. The *Capstone Concept for Joint Operations* [CCJO] performs this purpose as it conveys the Chairman’s vision for how the Joint Force will address future security challenges. Though the most recent CCJO provides a comprehensive vision discernibly reflected in MDB, it was published in 2012. This presents a challenge of relevancy in guiding the fast-paced, internet-fueled debates characteristic of modern times.

To actively guide future concept development, the Joint Staff should develop an intermediate means to convey evolving vision and spur focused and temporally-relevant collaboration. This intermediate medium does not have to convey a fully-developed concept. Rather, a concise summary of the Chairman’s assessment of unsolved military problems is required. To focus collaboration, the summary should, at a minimum, consist of open-ended questions and a list of prioritized military problem sets. In this, von Seeckt’s highly-successful solicitation of relevant feedback in the aftermath of World War I presents an appropriate historical model.

¹⁰ Ibid., 265.

To further stimulate joint operational innovation, the Joint Force's second primary requirement is to consolidate and propagate logical thought. Information technology can serve as a significant accelerant to this end. Recently, the DOD initiated a crowdsourcing campaign to solicit recommendations on topics critical towards restoration of U.S. comparative military advantage.¹¹ Though this initiative is a superb example of using information technology to generate insight from the entire defense community, the structure of it is unsupportive of the type of transparent, widespread debate that occurred in interwar Germany and the Soviet Union. Importantly, the submitted recommendations [and senior officials' appraisals of their relevance] were not made available for critique by the wider defense community. To support such an open exchange and accumulation of ideas, the U.S. Joint Staff J7 should establish an online forum that conveys a common picture of innovation to the whole of the Joint Force. Such a website could evolve from the Joint Lessons Learned Information System [JLLIS], which currently offers a [too] loosely-organized repository of insight into a variety of operational challenges.

The Joint Force's third primary requirement is to remain intellectually open. In recent remarks at a professional forum dedicated to MDB, U.S. Deputy Secretary of Defense Robert Work acknowledged that he was "not certain that MDB [as envisioned at the time] is going to be the final solution."¹² Those who hope for the certainty of clear, immediate answers may desire more conviction from the DOD's most senior leadership. However, when these comments are judged with the German and Soviet interwar experiences in mind, Work's perspective is critically important. After all, adopting any

¹¹ The announcement for this campaign can be found at the following URL: <http://www.defense.gov/News/Article/Article/1003542/dod-initiative-crowdsources-us-military-competitive-advantage> (accessed January 4, 2017).

¹² AUSA ILW, "CMF V: Multi-Domain Battle."

piece of equipment or theory of warfighting as a *patent solution* for future victory is quintessentially *einseitig*, the very condition the interwar German military reviled.

The Experimental JTF: Technological Change and the Physical Environment

Rigorous experimentation and testing in the realistic conditions of the physical environment allowed the interwar German and Soviet armies to optimize their concepts, doctrine, and force structures, and inform the design of emerging technologies. The MDB concept envisions tactical and operational commanders “evolving the combined arms methodology” across all domains.¹³ Though this proposition parallels German and Soviet interwar notions of joint combined arms maneuver, it exceeds the complexity of Blitzkrieg, deep battle, and even deep operations by an order of magnitude.

To fully comprehend the complexity of multi-domain combined arms maneuver, the U.S. DOD should immediately establish a tactical-level Joint Task Force [JTF] to test, evaluate, and optimize MDB concepts and supporting technologies. The JTF HQ must have the standing capacity and capability to integrate [and think openly about the integration of] fires and maneuver in all physical and abstract domains, from each of the Services. The JTF must also include assigned subordinate units from each Service to adequately examine the implementation of MDB at multiple echelons, develop realistic concepts for the employment of emerging technologies, and explore opportunities for greater tactical-level inter-service cooperation. Initial JTF operations could take place in

¹³ U.S. Army-Marine Corps White Paper. *Multi-Domain Battle: Combined Arms Operations for the XXI Century*, 7.

virtual and constructive environments, but the JTF must evolve in the near term to experiment in the realistic conditions presented by a live environment.¹⁴

Currently, each of the Services maintain their own experimental organizations. Undoubtedly, each of these organizations play significant roles in the development of concepts and technology to address military problems. Though these military problems are surely framed by joint perspectives, the Joint Force's center of gravity for experimentation nonetheless resides in service-level organizations. This approach creates gaps exploitable by adversaries seeking to fracture U.S. methods of warfighting with cross-domain capabilities. In an era in which all domains will be contested, carrying a service-centric approach forward without modification will amplify the risk of competing, and in some cases discordant, military capabilities.

MDB and the Next Combined-Systems Revolution

"The integration necessary for effective joint operations requires explicit effort; can increase operational complexity; and will require additional training, technical and technological interoperability, liaison, and planning. Although effectiveness is typically more important than efficiency in joint operations, the JFC and component commanders must determine when the potential benefits of joint integration cannot compensate for the additional complicating factors." JP 3-0, Joint Operations, January 2017

A number of significant challenges stand in the way of engineering a combined-systems revolution that will result in a U.S. Joint Force capable of operating across the whole of an MDB-inspired context. These challenges center on one overarching problem:

¹⁴ The Experimental JTF's insight will also directly inform decisions of more far-reaching magnitude, specifically involving matters of live joint training and organization, which are beyond this study's focus on presenting recommendations for immediate action.

the ability to integrate and synchronize joint functions across domains at the tactical level of war. To accomplish a combined-systems revolution of such historical magnitude, the Joint Force must examine the way it approaches its doctrine and develops its leaders.

MDB Doctrine

The introduction of new doctrine constitutes the crucial *diffusion* phase in military innovation, or, the “spread of a new *average practice*.”¹⁵ Both the German and Soviet militaries utilized doctrine as a means toward ensuring force-wide shared understanding. The U.S. Joint Force currently maintains a large body of doctrine that can be grouped into 83 joint publications and a larger number of subordinate service publications. Almost exclusively, activities at the tactical level of war are described by these service publications.¹⁶ Deference to individual service conceptualizations of tactical-level warfighting presents a major obstacle towards fielding a MDB-capable Joint Force.

Current joint doctrine notes this omission. JP 3-0 warns of several factors that frustrate joint force integration, the most noteworthy of which are the “different function oriented approaches, procedures, and perspectives” across the four Services.¹⁷ To develop a cohort of warfighters capable of integrating and synchronizing cross-domain combined arms, joint doctrine must become more *descriptive* of the tactics, techniques, and procedures required for a force to operate in a cross-domain context. A major, initial step

¹⁵ Beyerchen, “From Radio to Radar,” 267.

¹⁶ Chairman of the Joint Chiefs of Staff Manual [CJCSM] 5120.01A, *Joint Doctrine Development Process*, dated 29 December 2014, states that joint doctrine’s “principal target audiences [are] ... military forces performing at the operational level of war.”

¹⁷ U.S. Joint Chiefs of Staff, “JP 3-0: Joint Operations,” (Washington, DC: U.S. DOD, 17 January 2017), III-1.

towards becoming more descriptive includes the standardization of essential terminology.¹⁸

More consequentially, the Joint Force must expand the purpose of joint doctrine to meet the challenge of sophisticated adversaries capable of contesting it in all domains. The current aim of joint doctrine is to “enhance the operational effectiveness of U.S. joint forces.”¹⁹ This purpose implies an additive effect, in which joint doctrine is intended to augment service-level solutions to military problems. To succeed in multi-domain warfare, joint doctrinal development must begin with the premise that it perform a *unifying* function, just as the combined arms doctrine of the interwar period did. Accepting this premise will, subsequently, lead to a doctrinal re-examination of “the character of military tasks facing the republic.”²⁰ With broader agreement on joint solutions to military problems, the Joint Force will then be better positioned to critically examine how a coherent whole can interdependently leverage capabilities to solve these problems. These progressions constitute necessary steps towards fielding a joint force capable of integrating and synchronizing cross-domain capabilities at all levels of war.

Leader Development and Education

Current U.S. military publications identify experience, training, and education as precursors to efficient joint staff work and the creation of “innovative cross-domain solutions” to military problems.²¹ To this end, Joint Professional Military Education

¹⁸ As observed at the beginning of this study, there is presently no joint doctrinal definition for combined arms or joint combined arms maneuver. The same holds true for forms of maneuver, definitions for tactical mission tasks, and other concepts essential to the coordination of effective combined arms.

¹⁹ CJCSM 5120.01A, *Joint Doctrine Development Process*, B-2.

²⁰ Harrison, *The Russian Way of War*, 123. Emphasis mine.

²¹ U.S. Joint Chiefs of Staff, J-7, “Joint Planner’s Guide: Cross-Domain Synergy in Joint Operations” (Suffolk, VA: U.S. DOD, 14 January 2016), 26.

Phase 2 [JPME II], orientation programs offered by the Joint Staff, and Joint Knowledge Online's [JKO] repository of online lessons are the primary means to convey the required levels of joint training and education.²² As these programs are designed to support current joint operating requirements, they are wholly unsupportive of the tactical-level jointness envisioned by MDB. Compounding matters, these programs are generally retained for field or mid-grade officers, whereas MDB requires advanced joint competencies in the company or junior-grade cohort.

The Joint Staff should update existing policy for officer professional development and education to address this gap. To this end, particular emphasis must focus on enhancing guidance set forth for primary-level Professional Military Education [PME]. Current policy focuses primary-level PME on the development of branch and service-specific skills in officers in the grade of O-1 to O-3.²³ Though the prioritization of service-specific skills is appropriate, the policy establishes the ambiguous goal of instilling "joint awareness" in its junior officer corps.²⁴

The notion of joint awareness is vague and qualitatively different from current service-guided PME that fosters tactical-level combined arms proficiencies among junior officers. As an example, entry-level infantry and armor branch officers in the Army undergo extensive training and practical exercises to develop the ability to integrate and synchronize artillery fires. Establishing an academic foundation in the principles of combined arms during primary PME is an essential prerequisite before these officers can

²² Ibid.

²³ Refer to page A-A-A-1 in CJCSI 1800.01E, *Officer Professional Military Education Policy*, dated 22 November 2013.

²⁴ Ibid.

effectively lead small units in the operating force. To engender a similar foundation of MDB across the Joint Force, OPMEP must be updated to ensure the appropriate officers in all Services receive similar training, but with a joint tactical focus.

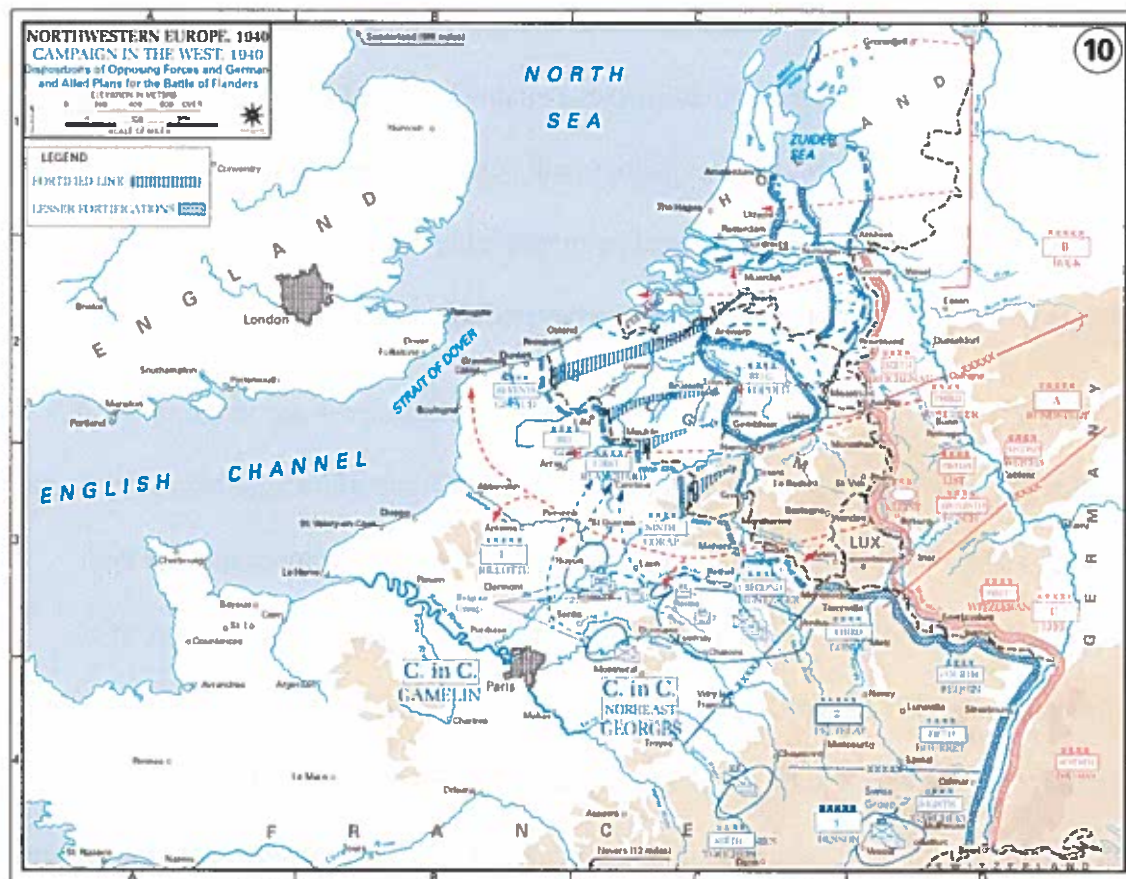
CHAPTER 5: CONCLUSION

The German and Soviet interwar military reform efforts were substantively alike. Through the 1920s and 1930s, both militaries remained focused on understanding, and ultimately winning, a war they were institutionally certain would come. This singular, enterprise-level focus engendered eras of open and critical debate in Germany and the Soviet Union that produced decisions on the battlefields of World War II.

Presented in this thesis as new contexts for war, *Blitzkrieg* and Operational Art disrupted previously-held paradigms for war and warfare and ultimately gave rise to new ways of warfighting that remain relevant nearly a century later. Importantly for both militaries, conceptual innovation did not founder in academy halls or the pages of professional journals. Instead, both militaries conducted extensive field experimentation to optimize their theories and inform further technical development. The interaction of technical and operational change with the operational environment subsequently nurtured broader and deeper institutional appraisals of war's changing character. Armed with new contexts for war, both militaries then developed doctrine, trained their formations, and ultimately adapted in war to achieve combined-systems revolutions that allowed them to dominate adversaries on a modern battlefield.

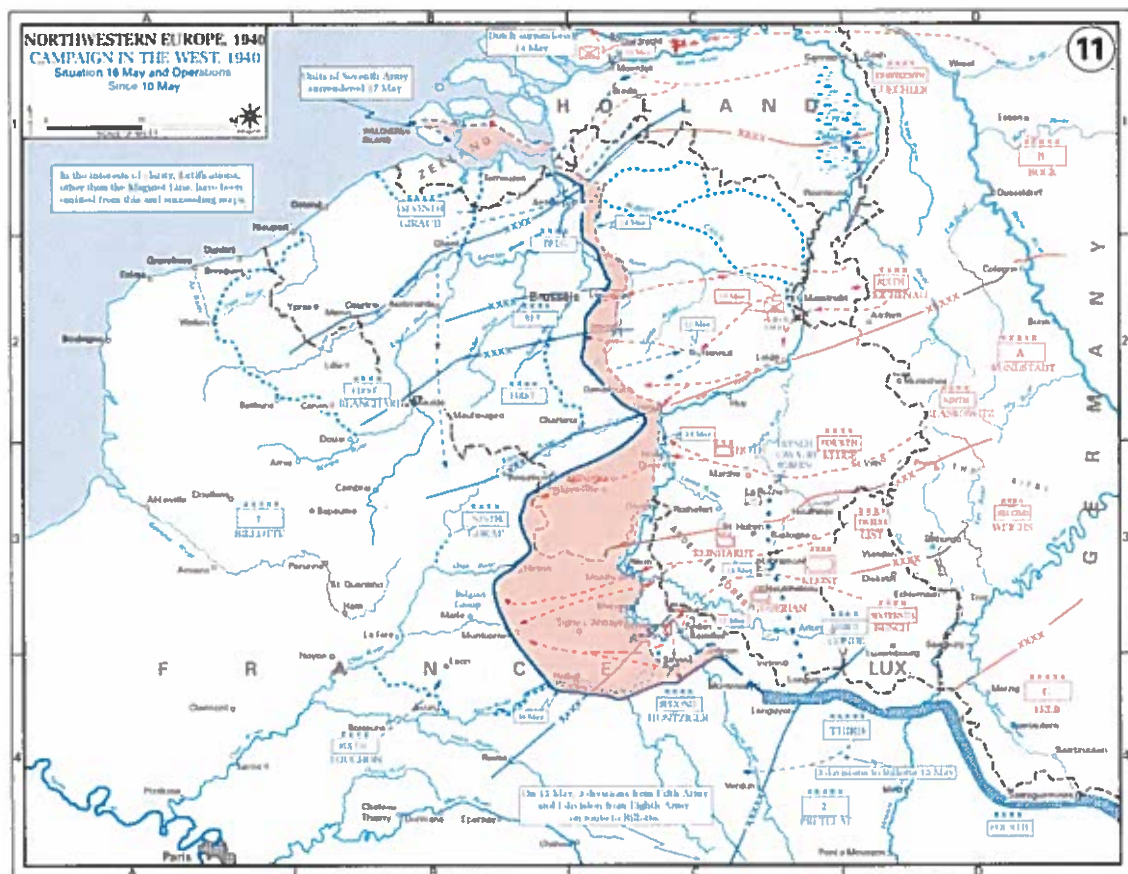
Under the huge umbrella of force development, the U.S. Joint Force's primary challenge today centers on a problem akin to those of the interwar Soviets and Germans. As it evolves a MDB-inspired new context for war, its simultaneous challenge is developing a force able to creatively operate *together* within the whole of that context. Maintaining a Service-centric status quo will derail either of these efforts.

Appendix 1: Northwestern Europe Situation Map, May-June 1940



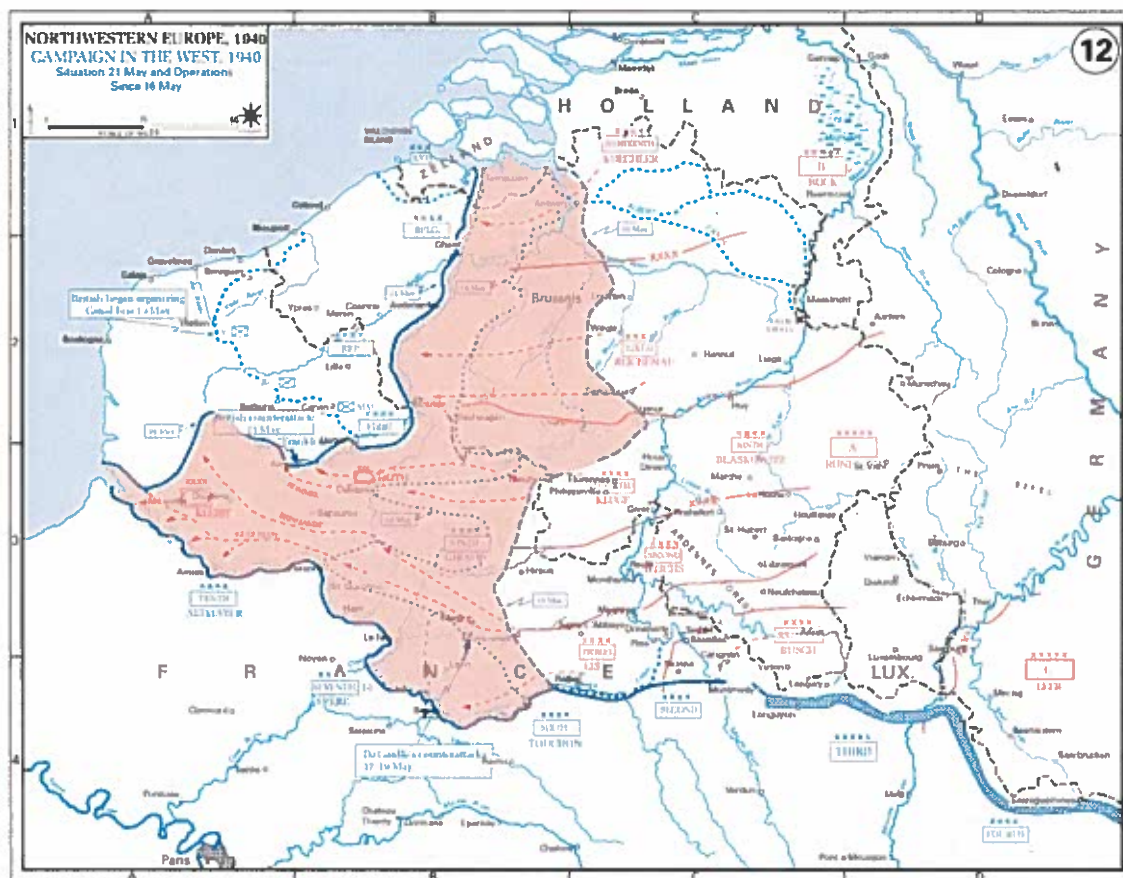
Source: "World War II European Theater," U.S. Military Academy Department of History, <http://www.westpoint.edu/history/SitePages/WWII%20European%20Theater.aspx> (accessed February 28, 2017).

Appendix 2: Northwestern Europe Situation Map, 10-16 May 1940



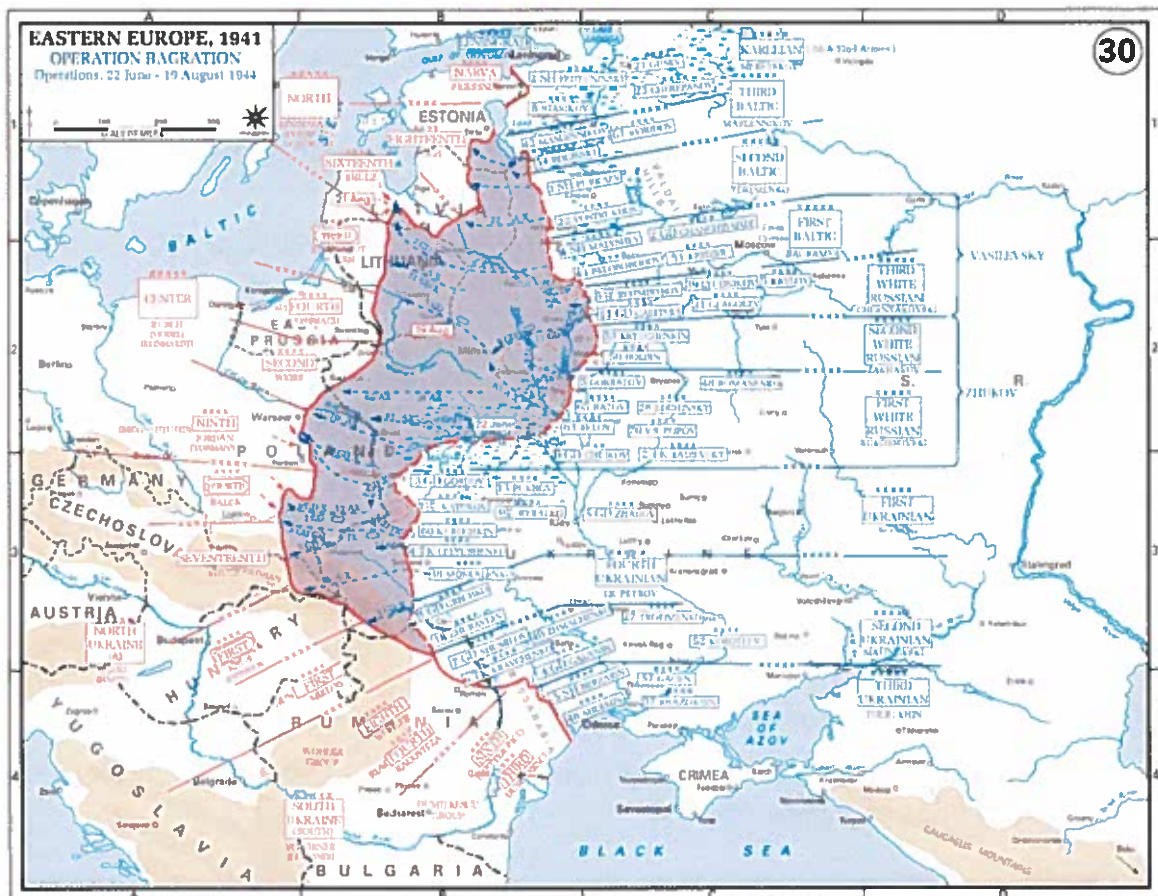
Source: "World War II European Theater," U.S. Military Academy Department of History, <http://www.westpoint.edu/history/SitePages/WWII%20European%20Theater.aspx> (accessed February 28, 2017).

Appendix 3: Northwestern Europe Situation Map, 16-21 May 1940



Source: "World War II European Theater," U.S. Military Academy Department of History, <http://www.westpoint.edu/history/SitePages/WWII%20European%20Theater.aspx> (accessed February 28, 2017).

Appendix 4: Operation Bagration Situation Map, June-August 1944



Source: "World War II European Theater," U.S. Military Academy Department of History, <http://www.westpoint.edu/history/SitePages/WWII%20European%20Theater.aspx> (accessed February 28, 2017)

Bibliography

- Batty, Peter. "The World at War, France Falls: May-June 1940" (video). November 14, 1973. Accessed November 27, 2016. <https://www.youtube.com/watch?v=9Umlu-bcuIY&t=1889s>.
- Boff, Jonathan. "Combined Arms during the Hundred Days Campaign, August-November 1918," *War in History* 17, no. 4. (2010): 459-478.
- Bungay, Stephen. *The Art of Action: How Leaders Close the Gaps between Plans, Actions, and Results*. Boston: Nicholas Brealy Publishing, 2011.
- Carafano, James. "The Third Offset: The 'Fairy Dust' Strategy." *The Heritage Foundation* (blog), November 25, 2014. Accessed November 27, 2016. <http://www.heritage.org/research/commentary/2014/11/the-third-offset-the-fairy-dust-strategy>.
- Corbett, Julian Stafford. *Some Principles of Maritime Strategy*. Project Gutenberg eBook, 2005.
- Citino, Robert. "Stalin's Revenge" (video). Lecture, The 2014 International Conference on World War II, The National WWII Museum, New Orleans, LA, December 2014. Accessed December 7, 2017. <https://livestream.com/nww2m/events/3632330/videos/70403585>.
- _____. *Blitzkrieg to Desert Storm: The Evolution of Operational Warfare*. Lawrence: University Press of Kansas, 2004.
- Drabkin, Artem, and Aleksey Isaev. "Soviet Storm: World War 2 in the East - Operation Bagration (11 of 18)" (video). 2011. Accessed December 9, 2016. <https://www.youtube.com/watch?v=w1SZRpPGVUk>.
- Fuller, JFC. *The Foundations of the Science of War, a Military Classics Reprint*. Fort Leavenworth: U.S. Army Command and General Staff College, 1993.
- Glantz, David M. "Soviet Operational Art and Tactics in the 1930s." Fort Leavenworth: Soviet Army Studies Office, 1990.
- _____. *The Soviet Conduct of Tactical Maneuver: Spearhead of the Offensive*. Portland: Frank Cass, 1991.
- _____. *Stumbling Colossus: The Red Army on the Eve of World War*. Lawrence: University Press of Kansas, 1998.
- _____. "Soviet Operational Art Since 1936." In *Historical Perspectives of the Operational Art*, edited by Michael D. Krause and Cody Phillips, 247-292. Washington, DC: U.S. Army Center of Military History, 2005.
- Glenn, Russell W. "Soviet Partisan Warfare: Integral to the Whole." Monograph, U.S. Army School of Advanced Military Studies, 1988.

- Hagel, Chuck. *The Defense Innovation Initiative*. Washington: U.S. Secretary of Defense, 2014.
- Hanson, Victor. "The Ironies of War?" *National Review*, April 11, 2003. Accessed October 16, 2016. <http://www.nationalreview.com/article/206570/>.
- Harrison, Richard W. *The Russian Way of War: Operational Art, 1904-1940*. Lawrence: University Press of Kansas, 2001.
- Hart, B.H. Liddell. *Strategy*. 2nd Revised Ed. New York: The Penguin Group, 1991.
- House, Jonathan M. *Combined Arms Warfare in the Twentieth Century*. Lawrence: University Press of Kansas, 2001.
- _____. *Toward Combined Arms Warfare: A Survey of 20th Century Tactics, Doctrine, and Organization, Research Survey No.2*. Fort Leavenworth: Combat Studies Institute, 1984.
- Howard, Michael. *War in European History*. New York: Oxford University Press, 1993.
- _____. "Military Science in an Age of Peace." *Journal of the Royal United Services Institute for Defence Studies* 1, no. 5 (March 1974): 3-10.
- Hughes, Daniel J., ed. *Moltke on the Art of War: Selected Writings*. Translated by Daniel J. Hughes and Harry Bell. New York: Ballantine Books, 1993.
- Keegan, John. *The First World War*. United States: Vintage Books, 2000.
- Kipp, Jacob W. "The Origins of Soviet Operational Art, 1917-1936." In *Historical Perspectives of the Operational Art*, edited by Michael D. Krause and Cody Phillips, 213-246. Washington, DC: U.S. Army Center of Military History, 2005.
- Kjoerstad, Ola. *German Officer Education in the Interwar Years*, MPhil Thesis. Glasgow: University of Glasgow, 2010.
- Knox, Macgregor and Murray, Williamson, ed. *The Dynamics of Military Revolution, 1300-2050*. New York: Cambridge University Press, 2008.
- Levy, Jack S. "The Offensive/Defensive Balance of Military Technology: A Theoretical and Historical Analysis," *International Studies Quarterly*, Vol. 28, no. 4. (June 1984): 219-238.
- Lindsey, Eric. *Beyond Coast Artillery: Cross-Domain Denial and the Army*. Washington, DC: Center for Strategic and Budgetary Assessments, 2014.
- Martinage, Robert. *Toward a New Offset Strategy: Exploring U.S. Long-Term Advantages to Restore U.S. Global Power Projection Capability*. Washington, DC: Center for Strategic and Budgetary Assessments, 2014.
- Miksche, Ferdinand O. *Attack: A Study of Blitzkrieg Tactics*. Carlisle: U.S. Army War College, 1983.
- Murray, Williamson and Millett, Allan, ed. *Military Effectiveness Volume 2: The Interwar Period*. New York: Cambridge University Press, 2010.

- _____. *Military Effectiveness Volume 3: The Second World War*. New York: Cambridge University Press, 2010.
- _____. *Military Innovation in the Interwar Period*. New York: Cambridge University Press, 1996.
- Naveh, Shimon. *In Pursuit of Military Excellence: The Evolution of Operational Theory*. London: Frank Cass, 2006.
- Otis, G.K. "Rear Area Security in the Field Army Service Area." MMAS thesis, U.S. Army Command and General Staff College, 1965.
- Parker, Geoffrey, ed. *The Cambridge Illustrated History of Warfare: The Triumph of the West*. Cambridge: Cambridge University Press, 2004.
- Pirnie, Bruce R. *Soviet Deception Operations during World War II*. Washington, DC: U.S. Army Center of Military History, 1985.
- Radomska, Sofiya. "Soviet-German Relations in the Interwar Period." Master's thesis, Södertörns Högskola University College, 2006. Accessed November 27, 2016. <http://kth.diva-portal.org/smash/get/diva2:16401/FULLTEXT01.pdf>.
- Rice, Condoleezza. "The Making of Soviet Strategy." In *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, edited by Peter Paret, 648-676. Princeton: Princeton University Press, 1986.
- Sterling, Michael. *A Rand Note: Soviet Reactions to NATO's Emerging Technologies for Deep Attack*. Santa Monica: The Rand Corporation, 1985. Accessed November 27, 2016. <http://www.dtic.mil/dtic/tr/fulltext/u2/a166975.pdf>.
- Storey, William Kelleher. *The First World War: A Concise Global History*. 2nd Ed. London: Rowman and Littlefield, 2014.
- Tyushkevich, S.A. *The Soviet Armed Forces: A History of their Organizational Development*. Translated by the CIS Multilingual Section Translation Bureau, Canadian Secretary of State Department. Washington: U.S. Government Printing Office, 1978.
- U.S. Army-Marine Corps White Paper. *Multi-Domain Battle: Combined Arms Operations for the XXI Century, DRAFT v. 0.40*. Army Capabilities Integration Center, Capability Development and Learning Directorate, Joint and Army Concepts Division and Marine Corps Combat Development Command, Marine Corps Warfighting Laboratory, Futures Directorate, 29 August 2016.
- _____. *Multi-Domain Battle: Combined Arms Operations for the XXI Century*. Army Capabilities Integration Center, Capability Development and Learning Directorate, Joint and Army Concepts Division and Marine Corps Combat Development Command, Marine Corps Warfighting Laboratory, Futures Directorate, 18 January 2017.

- U.S. Department of Defense. "Department of Defense Dictionary of Military and Associated Terms." Joint Electronic Library. December 15, 2016.
<https://jdeis.js.mil/jdeis/> (accessed February 18, 2017).
- U.S. Joint Chiefs of Staff. *Joint Operating Environment 2035: The Joint Force in a Contested and Disordered World*. Washington, DC: U.S. Joint Chiefs of Staff, 14 July 2016.
- _____. *Joint Concept for Entry Operations*. Washington, DC: U.S. Joint Chiefs of Staff, 7 April 2014.
- _____. *Capstone Concept for Joint Operations: Joint Force 2020*. Washington, DC: U.S. Joint Chiefs of Staff, 10 September 2012.
- U.S. Marine Corps Headquarters. *German Tactical Doctrine (FMFRP 12-11)*. Quantico: Marine Corps Combat Development Command, 1989.
- Van Creveld, Martin. *Air Power and Maneuver Warfare*. Maxwell Air Force Base: Air University Press, July 1994.
- _____. *The Training of Officers: From Military Professionalism to Irrelevance*. New York: The Free Press, 1990.
- Vercamer, Arvo, and Jason Pitts. "German Military in the Soviet Union 1918-1933." *Feldgrau*, 1996-2015. Accessed November 27, 2016.
<http://www.feldgrau.com/articles.php?ID=23>.
- Von Clausewitz, Carl. *On War*. Edited and translated by Michael Howard and Peter Paret. New York: Alfred A. Knopf, 1993.
- Williams, Brett T. "The Joint Force Commander's Guide to Cyberspace Operations," *Joint Forces Quarterly*, Vol. 73 (2nd Quarter 2014): 12-19.
- Winton, Harold R. and David R. Mets, ed., *The Challenge of Change: Military Institutions and New Realities, 1918-1941*. Lincoln: University of Nebraska Press, 2003.

Vitae

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